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# A Catalogue of U.S. Manufacturing Networks



United States Department of Commerce  
Technology Administration  
National Institute of Standards and Technology

This report was prepared as an account of work sponsored by the State Technology Extension Program of the National Institute of Standards and Technology, an agency of the United States Government.

The State Technology Extension Program provides technical assistance to State and local technology programs throughout the United States to help those programs improve the competitiveness of small and medium-sized businesses through the application of new technology. This effort was mandated by the Omnibus Trade and Competitiveness Act of 1988.

Program efforts focus on helping State and local technology assistance providers enhance and develop their capability to meet the competitiveness needs of local industry. Specific activities include:

- stimulating cooperation and communication between and within State programs to enhance their capability to meet the needs of local businesses;
- partnering with other Federal agencies to help coordinate Federal efforts in technology and industry assistance;
- collecting and disseminating information about successful technology assistance activities, such as best practices, model programs, and common tools;
- providing technical information and assistance to State and local technical assistance programs in applying methods for transferring technology to businesses; and
- providing matching grants for development and coordination of technology assistance activities.

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# **A Catalogue of U.S. Manufacturing Networks**

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Gaithersburg, MD 20899

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## **ABSTRACT**

This publication contains information on collaborative groups of firms that have come together to gain competitive advantages that an individual company might not achieve by working alone. The activities of these groups, or networks, can be quite diverse. They can engage in joint production, collective marketing, worker training, new product development, technology transfer or the adoption of total quality management practices. Through collaboration, these firms can reduce the costs of such projects, gain access to new markets and learn more important skills that will enhance their competitiveness.

The purpose of this catalogue is to present examples of manufacturing networks in the United States. It is designed to serve as a tool for government officials, public policy makers economic development practioners and firm managers to gain a better understanding of what manufacturing networks are and how they work in the United States.

The 27 network descriptions contained in this catalogue are based on information obtained by telephone interviews with network brokers or organizers and from written materials.

### **Key Words:**

Broker; collaborative groups; collective marketing; competitiveness; flexible manufacturing; joint production; manufacturing networks; partner; technology transfer.



## **I. INTRODUCTION**

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### **Purpose of This Catalogue**

Manufacturing networks are groups of firms that come together to gain competitive advantages that no individual company could achieve by working alone. The activities of such networks can be quite diverse. They can engage in joint production, collective marketing, worker training, new product development, technology transfer and the adoption of total quality management practices. Through collaboration, these firms can reduce the costs of such projects, gain access to new markets and learn important skills that will enhance their competitiveness.

Interest in collaborative approaches to economic development have been growing over the last several years. Examples of successful networking among manufacturing firms in Europe and Japan have stimulated U.S. policymakers to consider their application in this country.

The purpose of this catalogue is to present examples of manufacturing networks in the U.S. This document contains two-page-length descriptions of 27 networks. The descriptions contain information about network objectives, types of firms, activities, funding, brokers, organizational structure and success factors as well as lessons learned. This catalogue is intended to enable government officials, public policymakers, economic development practitioners and firm owners or managers to gain a better understanding of what manufacturing networks are and how they work in the U.S.

### **Manufacturing Networks: A Definition**

Manufacturing networks are characterized by relationships of collaboration or interdependence among firms. The interactions between participants are neither dominated by any one firm, nor are they simple economic exchanges motivated by calculations of price and quantity. Firms in these networks are partners--they must rely on each other in order to accomplish their objectives. It is this interdependence or mutuality of need and benefit which lies at the heart of any successful network.

The networks described in this catalogue are attempting to make fundamental changes in the ways member firms conduct their business. Their principal objective is to develop new capabilities, processes, products, markets or customers. Simply reducing costs and competing on price alone is not enough; economic history demonstrates that long-run competitive advantage can only be sustained through development and innovation.

These efforts to create networks have been undertaken intentionally rather than emerging by happenstance. It is believed that by organizing firms and creating a foundation for collaboration, networks can be more efficient and effective.



## **Selection of Networks**

The networks in this catalogue were selected according to two criteria: they involve direct interaction among at least three firms, and they have begun to achieve results or at least have initiated the activities necessary to produce results. While definitions about what constitutes a network are still hotly debated, we have tried to present a variety of different projects and approaches. In the search for projects to be included in both the body of the catalogue as well as in the appendixes, there were invariably projects we missed; our apologies to those that were left out.

## **Network Descriptions**

The following 27 descriptions are organized alphabetically by name. The next section contains an index (page 6) that can be used to identify networks according to characteristics such as location (State), industry, objectives and approach.

The information contained in the descriptions was obtained by phone interview with network brokers or organizers and from written material. It is organized into 15 categories:

Network Name--the name by which the network is referred.

Objective--the purpose of the network and the major goals it hopes to achieve.

Types of Firms--the number and industry sector of participating firms.

Membership Requirements--the formal and informal criteria for participation and the responsibilities of the firms, such as dues, meeting attendance, etc.

Governance Structure--the formal or informal decision-making structure and process of the network.

Activities--descriptions of current projects undertaken by the network.

Future Goals--anticipated projects and goals.

Funding--the amount, source and duration of the monies required to start and manage the network.

Sponsors--organizations which have taken a role in initiating the network, by providing support, credibility, encouragement or funding, but who are not necessarily responsible for organizing and managing it.

Broker--the individual or organization responsible for organizing or facilitating network activities.

Genesis--the history of the network and the process by which it was started.



Challenges--the difficulties encountered in creating and managing the network.

Success Factors--the key elements that have enabled the network to achieve its current level of success.

Lessons Learned--the important lessons learned by the members, brokers or sponsors.

Contact--the source of additional information about the network.

## **General Observations**

The network projects described in this catalogue represent experiments in collaborative approaches to economic development. They exhibit an incredible variety of objectives, strategies, participants, sponsors and brokers. This diversity makes them difficult to describe. We are only beginning to develop a sufficient base of experience from which to draw conclusions about what works and why.

The majority of the U.S. manufacturing networks investigated for this catalogue are clustered in three major industries: metalworking (10), woodworking (10) and clothing (4). There are also mixed industry (2), plastics (1) and defense-related (1) networks. Pennsylvania (6), New York (5) and Ohio (4) have the greatest number of "established" networks as of this date. Networks have been formed in urban as well as rural areas. The oldest network or collaborative program, the Garment Industry Development Center, was started in 1984. The Metalworking Consortium in Chicago dates from 1986. Most network programs are no more than 2 years old. Between 50 and 100 new network efforts have been announced within the last 9 months. (Short summaries of many of these are presented in Appendix A.)

Most networks have multiple objectives. The most common are: marketing (21), training (10), production (8), technology transfer/assistance (8), new product development (7), purchasing (6) and quality improvement (4). Programmatically, many networks are attempting to either provide or coordinate the delivery of a variety of services to meet the needs of manufacturing firms.

A variety of approaches are being used to develop networks. The most common strategy use brokers (from either economic development agencies (12), universities or community colleges (3), independent individuals (3) and community development organizations (2)). Other approaches utilize industry service centers (4--three in the garment and one in the plastics industry), trade associations (4), unions (3--all in the garment industry), facilities (1), self-organized joint ventures (1) or lead firm/constellation configurations (1).

An important catalyst for networks has been recent efforts at the State and Federal level to encourage modernization and the adoption of new technology among small and medium sized manufacturing firms. Another has been the realization by firm owners about the nature of the competitive challenges they face and the benefits of collaboration. But poor economic conditions have been the most significant motivator.



There are many challenges to developing successful networks. The commonly mentioned ones were: overcoming the competitive mindset of many firms, obtaining participation, developing relationships of trust, managing differences among individuals and firms, the lack of resources and inconsistency of funding, defining a group agenda and ensuring that the network is industry driven.

Firms and brokers have reported learning a number of lessons from their experience, such as the need for an industry champion, the need for an outside facilitator or broker, that network creation is a slow process, that every network is unique and that participation is built one small success at a time.

None of the networks in this catalogue are self-sufficient at this time. Funding comes from a variety of sources--State governments and foundations being the most common. Firms as well as economic development agencies and unions also contribute, although their share currently constitutes a small percentage. Total funding ranges from \$10,000 to \$100,000 per year. Money from outside the network is critical in seeding these efforts. Only certain network functions, such as those that directly produce revenue or lead to tangible cost reductions, have the potential to be self-supporting. Others, such as general network development, matchmaking and creation/maintenance of the system of relationships, are public goods and must be supported (or invested in), either by the firms or other organizations.

### **Issues to Address**

The growing interest in manufacturing networks as a strategy for improving industry performance raises a number of questions that should be considered by both policymakers and practitioners alike:

- \* What are the strengths as well as the limitations of manufacturing networks as a strategy for economic development? Under what kinds of conditions are networks appropriate? Networks seem to be more common in those industries, such as metalworking or woodworking, that are dominated by small and medium-sized firms. The relative fragmentation of these industries provides motivation for firms to seek economies of scale and scope by collaborating with others. Yet, at the same time the challenge is to develop the relationships of trust necessary to work together closely and to carefully manage the costs of coordination.

- \* How do we integrate this approach with other economic development policies and programs? By themselves, manufacturing networks cannot address all the challenges confronting small and medium-sized manufacturing firms. Various projects are already trying to tie their efforts into other types of economic development programs in a way that is mutually beneficial.

- \* How do we encourage the creation of networks? Several States are experimenting with a variety of approaches including challenge grant programs, broker training and targeted network projects through manufacturing assistance agencies, community colleges and local



trade associations. Foundations have provided funds to local community development organizations and, in several cases, organizations that are associated with local trade unions. The variety of examples is enriching.

\* How should networks be supported? None of the networks examined in this catalogue have achieved self-sufficiency. It is not clear when this will occur or how; nor even whether such a goal is practical. But lack of funding is clearly a problem. Several States have provided seed funding to cover start-up costs. However, as networks are implemented and needs identified, funds are needed to establish the programs necessary to fulfill those needs. Although firms will contribute when they perceive the value, their resources are not always sufficient to the task particularly at these initial stages. Funding must be available to carry a network project to a stage when firms can continue it on their own or when the project itself begins to generate enough revenue to support itself.

\* How should the performance of networks be evaluated? This is not a simple question. Network strategies are long-term in nature. As a result, methods of evaluation must be found that take into account their unique natures and the importance of such intangible factors as learning, relationships and trust to their success. Such a methodology must provide a more objective basis for making judgments about a network's progress and prospects for success, than what currently exists.

It is too early at this stage to report significant, quantifiable impacts. More time will be required before we can evaluate network success. However, it has been observed that one of the most significant contributions of networks is the learning or development that occurs which leads to increased competitiveness. The difficulty is that such "outcomes" are intangible and cannot be measured by conventional means. Therefore, new concepts are required to understand, manage and evaluate the developmental benefits of networks. With this kind of a perspective, it can be argued that networks should also be evaluated on the basis of their ability to "create opportunities," as well as to produce outcomes.

Conceptually, manufacturing networks are not difficult to understand. The challenge lies in their implementation. We must learn from the experience of those firms and economic development agencies that are struggling to make them a success.

## II. NETWORK PROJECT INDEX

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In the following index, networks are classified according to location (State), industry, objective and approach. This index can be used to identify those projects in this catalogue with certain desired characteristics.

### INDEXED BY STATE

Alabama

Arkansas

The Metalworking Connection, Inc.

Florida

Technology Coast Manufacturing and Engineering Network

Illinois

The Metalworking Consortium

Indiana

The FlexCell Group

Kansas

Kentucky

Kentucky Wood Manufacturers Network

Louisiana

Louisiana Furniture Industry Association

Maine

Maryland

Mechtech, Inc. Baltimore

Massachusetts

Needle Trades Action Project



Michigan

Minnesota

Wood Products Manufacturing Network, Inc.  
Flexible Manufacturing Network Project

Montana

New York

Center for Design and Manufacturing in Greenpoint  
Furniture New York  
Garment Industry Development Corporation  
Greater Syracuse Metalworking Industry (GSMI)  
Knitwear Industry Center

North Carolina

Ohio

Accessible Housing Components  
Heat Treating Network, Inc.  
Ohio Forging Network  
Mahoning Valley Aluminum Extruders Network

Oregon

Pennsylvania

Erie Bolt  
Lehigh Valley Apparel and Textile Network  
Manufacturing Innovation Network Plastics Initiative  
The Philadelphia Collection  
The Philadelphia Guild  
Western Pennsylvania Regional Metalworking Network

South Carolina

Washington

Pacific Wood Products Cooperative  
WoodNet

Wisconsin

## INDEXED BY TYPE OF INDUSTRY

### Apparel/Textile

- Garment Industry Development Corporation
- Knitwear Industry Center
- Lehigh Valley Apparel and Textile Network
- Needle Trades Action Project

### Defense-Related

- Technology Coast Manufacturing and Engineering Network

### Labor Involvement

- Garment Industry Development Corporation
- Lehigh Valley Apparel and Textile Network
- Needle Trades Action Project

### Metalworking

- Erie Bolt
- The FlexCell Group
- Greater Syracuse Metalworking Industry (GSMI)
- Heat Treating Network, Inc.
- Mahoning Valley Aluminum Extruders Network
- Mechtech, Inc. Baltimore
- The Metalworking Connection, Inc.
- The Metalworking Consortium
- Ohio Forging Network
- Western Pennsylvania Regional Metalworking Network

### Mixed Industries

- Accessible Housing Components
- Flexible Manufacturing Network Project

### Plastics

- Manufacturing Innovation Network Plastics Initiative

### Woodworking

- Accessible Housing Components
- Center for Design and Manufacturing in Greenpoint
- Furniture New York
- Kentucky Wood Manufacturers Network



Louisiana Furniture Industry Association  
Pacific Wood Products Cooperative  
The Philadelphia Collection  
The Philadelphia Guild  
Wood Products Manufacturing Network, Inc.  
WoodNet

## **INDEXED BY NETWORK OBJECTIVE**

### **Export**

Furniture New York  
Garment Industry Development Corporation

### **Labor/Management Cooperation**

Lehigh Valley Apparel and Textile Network

### **Marketing**

Center for Design and Manufacturing in Greenpoint  
Erie Bolt  
Flexible Manufacturing Network Project  
Furniture New York  
Garment Industry Development Corporation  
Greater Syracuse Metalworking Industry (GSMI)  
Kentucky Wood Manufacturers Network  
Knitwear Industry Center  
Louisiana Furniture Industry Association  
Manufacturing Innovation Network Plastics Initiative  
The Metalworking Connection, Inc.  
The Metalworking Consortium  
Needle Trades Action Project  
The Philadelphia Collection  
The Philadelphia Guild  
Ohio Forging Network  
Pacific Wood Products Cooperative  
Technology Coast Manufacturing and Engineering Network  
Western Pennsylvania Regional Metalworking Network  
Wood Products Manufacturing Network, Inc.  
WoodNet

### **New Product Development**

Accessible Housing Components

Furniture New York  
The Metalworking Consortium  
The Philadelphia Guild  
Pacific Wood Products Cooperative  
Wood Products Manufacturing Network, Inc.  
WoodNet

## Production

Accessible Housing Components  
Erie Bolt  
The FlexCell Group  
Knitwear Industry Center  
Louisiana Furniture Industry Association  
Technology Coast Manufacturing and Engineering Network

Wood Products Manufacturing Network, Inc.  
WoodNet

## Purchasing

Flexible Manufacturing Network Project  
Knitwear Industry Center  
The Metalworking Connection, Inc.  
The Metalworking Consortium  
Pacific Wood Products Cooperative  
Technology Coast Manufacturing and Engineering Network

## Quality Improvement

Erie Bolt  
Knitwear Industry Center  
Mahoning Valley Aluminum Extruders Network  
Ohio Forging Network

## Technology Transfer/Assistance

Garment Industry Development Corporation  
Heat Treating Network, Inc.  
Kentucky Wood Manufacturers Network  
Lehigh Valley Apparel and Textile Network  
The Metalworking Consortium  
Needle Trades Action Project  
Ohio Forging Network  
Wood Products Manufacturing Network, Inc.



## Training

- Flexible Manufacturing Network Project
- Garment Industry Development Corporation
- Knitwear Industry Center
- Lehigh Valley Apparel and Textile Network
- Louisiana Furniture Industry Association
- Mahoning Valley Aluminum Extruders Network
- Mechtech, Inc. Baltimore
- The Metalworking Connection, Inc.
- Needle Trades Action Project
- Western Pennsylvania Regional Metalworking Network

## Waste Management

- Mahoning Valley Aluminum Extruders Network
- Pacific Wood Products Cooperative

## INDEXED BY ORGANIZATIONAL APPROACH

### Facility-Based Network

- Center for Design and Manufacturing in Greenpoint

### Brokered--Community Development Organization

- Accessible Housing Components
- The Metalworking Consortium

### Brokered--Economic Development Agency

- Center for Design and Manufacturing in Greenpoint
- Flexible Manufacturing Network Project
- Furniture New York
- Kentucky Wood Manufacturers Network
- Mahoning Valley Aluminum Extruders Network
- Ohio Forging Network
- Pacific Wood Products Cooperative
- The Philadelphia Collection
- The Philadelphia Guild
- Western Pennsylvania Regional Metalworking Network
- Wood Products Manufacturing Network, Inc.
- WoodNet

## Brokered--Universities, Community Colleges

Technology Coast Manufacturing and

## Engineering Network

The Metalworking Connection, Inc.

Manufacturing Innovation Network Plastics Initiative

## Brokered--Other (Individual, etc.)

Heat Treating Network, Inc.

Louisiana Furniture Industry Association

Needle Trades Action Project

## Industry Service Center

Garment Industry Development Corporation

Knitwear Industry Center

Needle Trades Action Project

Manufacturing Innovation Network Plastics Initiative

## Joint Venture (Self-Organized by Firms)

The FlexCell Group

see also Maine in Appendix A

## Lead Firm/Constellation

Erie Bolt

## Trade Associations

Greater Syracuse Metalworking Industry (GSMI)

Mechtech, Inc. Baltimore

Western Pennsylvania Regional Metalworking Network

Lehigh Valley Apparel and Textile Network

## Union

Garment Industry Development Corporation

Needle Trades Action Project

Lehigh Valley Apparel and Textile Network



### III. PROJECT CATALOGUE

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## ACCESSIBLE HOUSING COMPONENTS

Objective: To develop and manufacture new products through vertically integrated networks of firms directly connected to end-users.

Types of Firms: Thirty firms from metalworking, woodworking, electronics, plastics and related industries have been involved in the design, development, production and marketing of three product lines for elders and people with disabilities.

Membership Requirements: Firms first become part of an informal network by participating in design and prototype activities. Specific production networks consisting of three to six firms then form for particular purposes through negotiation with the lead firm, which is currently Accessible Design \* Adjustable Systems (AD\*AS)--the sponsoring organization's for-profit subsidiary.

Governance Structure: Based on informal negotiation. A more formal association of firms is likely to be formed by 1993.

Activities: In 1989, ACEnet (the sponsor) began to analyze emerging markets with unmet needs in industries suitable for networked production. They identified accessible housing for the elderly and people with disabilities as promising. ACEnet began to establish connections with housing developers and various end-user groups in fall of 1991 while simultaneously contacting over 70 area manufacturing firms to determine their capabilities for and interest in such a network. Products focus on achieving accessibility through adjustable storage units and work surfaces. A number of firms were asked to participate in the prototype development of an accessible kitchen. Out of that initial prototype, three product lines have been developed: electrically adjustable kitchen storage and work surfaces; manually adjustable wall-hung desks for educational institutions; and a line of both electrically and manually adjustable, free-standing workstations. Early in the process, AD\*AS was formed to coordinate product development, distributed production and marketing. Production to fill orders began in January 1992.

Participating firms are developing relationships with each other and with ACENET through problem-solving and design sessions.

Future Plans: While AD\*AS is initiating and coordinating production, ACEnet is developing the infrastructure and support systems that will enable other joint production networks to be formed. Major areas of infrastructure development include: access to capital, modernization, telecommunications and targeted training to insure a sufficient pool of skilled workers. Additional product lines will be developed for the same market. Other area firms will be encouraged to initiate joint production networks.

Funding: Obtained \$20,000 in 1989 from Joyce Foundation to conduct research and develop the concepts for flexible manufacturing networks. In 1990, received \$200,000 for 2 years from Ohio's Department of Development to develop the strategy for a network. The Joyce Foundation provided \$60,000 and \$75,000 respectively for second and third years of support. Received \$15,000 from the Cooperative Development Fund, \$20,000 from the



Cooperative Bank and support from the local community.

A closely related, local software development firm has recently received a \$50,000 Small Business Innovation Research grant to begin development of a computer-based distributed production coordination system for manufacturing networks.

Sponsor: Appalachian Center for Economic Networks (ACEnet) is a nonprofit economic development organization serving an 11-county area of rural, southeastern Ohio.

Broker: There is no single broker; rather ACEnet and AD\*AS are brokering organizations. ACEnet is responsible for developing the infrastructure, while AD\*AS manages specific joint production opportunities. Team members have backgrounds in such areas as systems development, training, computer systems, cooperative business development, organization development, manufacturing, product development and marketing. It is hoped that the brokering function will eventually become widely distributed among the firms.

Genesis: See Activities.

Challenges: Coordinating distributed production in a rural area where firms are widely dispersed; introducing small manufacturers who have been second- and third-tier suppliers to production for final consumption; finding ways to facilitate growth toward collaborative projects.

Success Factors: Network is market-driven; identified a large and rapidly expanding market that lends itself to network-style production.

Lessons Learned: There is value in having a well-developed, conceptual framework to guide actions, but concrete production projects are what will carry the project forward and get firms involved. For a market-driven, vertically integrated system to work, the sponsoring organization may need to create some of the missing pieces, since not all of the functions necessary for success exist in rural areas. A cross-industry project greatly lessens competitive tensions and enhances the sharing of information and willingness to cooperate.

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## **CENTER FOR DESIGN AND MANUFACTURING IN GREENPOINT**

Objective: To support, organize and expand the informal networking occurring among firms within the building and to market the firms as a group.

Types of Firms: Twelve of the 45 firms in the 32,000 square-meter (360,000 square-foot) city-owned building are active participants. Twenty of the firms are small fine- or industrial-arts shops that perform custom, high-end jobs. Four are traditional manufacturers. There are a dozen woodworking firms with various capabilities: carving, table saws and CAD/CAM. Firms range in size from one to 30 employees, with as much as \$1 million in sales.

Membership Requirements: Tenancy in the building.

Governance Structure: Four firms sit on the board of a nonprofit corporation. This organization is also taking over control and management of the building.

Activities: An informal network of business relationships exists among a number of firms in the building, particularly the woodworking companies. An estimated 20 percent to 30 percent of the gross invoicing of 10 firms originates with each other. Some companies purchase materials together, work collectively on common environmental problems, use each others' space for warehousing as well as share or borrow equipment such as spray booths, table saws and other automated equipment. Much of the interaction flows from the largest shop to the smaller ones. An Italian woodworking company came to the United States to launch a new hospitality/restoration business and moved into the building because of the network of firms and the owner's desire to subcontract to them.

Weekly building-wide meetings have been initiated in order for firms to get to know one another. A directory is being produced for internal as well as external use.

Future Plans: Possible activities include hiring a marketing firm, producing a brochure for a direct-market mailing or telemarketing and holding a building-wide show in which the entire network of firms can market itself as a furniture and interior supermarket with factory-direct prices.

Funding: New York State has committed \$33,000 for 1992.

Sponsor: North Brooklyn Development Corporation.

Broker: Economic development consultant to the North Brooklyn Development Corporation.

Genesis: Building has been occupied since 1860. In 1985, the first woodworkers moved in. Owner abandoned lease in 1988. To save their subleases, four firms set up a corporation to assume the lease. In order to reduce management expenses and finance repairs, these firms drew in other woodworkers--old employers and ex-partners, who lived nearby and were attracted by the proximity to Manhattan and the skilled labor force. North Brooklyn Development Corporation became involved in 1988 in order to help manage the building, which is half rented. The idea for an organized network effort emerged in 1989.



Challenges: The variation in approaches to the network taken by different businesses and their level of investment in the process. Shifting the mindset of those firms that treat others as customers rather than partners. Patching up relationships in failed partnership attempts. Obtaining more participation from the small shops, who wait for the stronger businesses to take the lead.

Success Factor: Geographic proximity.

Lessons Learned: Networks function more smoothly with compatible rather than competitive producers. Without State money, the start-up of a network is tricky; firms are interested in exploring opportunities if the State provides support to get started. Only minimal resources are needed initially, but it must be sufficient to seed some kind of an effort and grease the wheels. Many of these firms have never done any marketing, therefore they don't know how to do it or how to evaluate an investment in it. An industry champion is needed to lead the effort.

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## **ERIE BOLT**

Objective: To create an informal network of firms among Erie Bolt's suppliers and other firms in local manufacturing community as a strategy for broadening company's markets, expanding business and improving profitability.

Types of Firms: Erie Bolt produces critical metal parts and components for diesel engines, nuclear generating stations, ships and missile launch tubes. Firm has 83 employees and \$6 million in sales. It has worked with 30 firms who were either existing suppliers or companies attracted to Erie Bolt through publicity about its efforts.

Membership Requirements: None.

Governance Structure: None.

Genesis and Activities: On becoming owner/manager of firm in 1986, Harry Brown decided to work with other firms to reduce costs, improve quality and increase the capabilities his firm could offer to customers as an individual company and as part of a network of firms. He visited vendors individually, explained his goals and developed face-to-face relationships.

Brown worked closely with suppliers to improve production processes by sharing information, allowing them to use gauges and instruments (including the firm's CAD system), and even lending them his engineers. Companies now share a common gauge room and a library of manufacturing specifications. A video library on technical subjects has been established at the Manufacturers Association of Northwest Pennsylvania.

For small shops that did not understand marketing and could not afford to sell outside the area, Brown offered a marketing seminar through Penn State's extension service taught by his marketing manager. Firms learned about the importance of total quality, how to describe their capabilities to a manufacturing representative and how to choose, manage and pay a manufacturing representative. As a result of this seminar, 30 percent of the attendees set up their own sales force.

Firms have also tried several innovations first implemented in Erie Bolt. When Brown taught his employees to read financial statements and he began posting them, other firms in the network followed suit.

The network is informal and unstructured. Work, information and referrals have flowed in both directions. Firms' capabilities have increased and have significantly impacted their success and profitability.

Future Plans: To improve local training infrastructure for manufacturing firms through a new 2-year degree granting institute for manufacturing starting in January 1992 and coordinating efforts to get teachers to network in the school systems. To introduce new heating technology into forging shops. To open up a contract service division of his company.

Funding: Company funded.



Sponsor: Self-sponsored.

Broker: Owner of Erie Bolt.

Challenges: Drawing firms into the process, overcoming suspicions and creating trust, managing relationships, coping with peer pressure from other manufacturers who believe sharing is bad.

Success Factors: Honesty and forthrightness about corporate goals, persuading firms to take a risk, listening, being willing to exchange information, teaching firms how to do something differently--not just telling them to do it, being able to satisfy all of customers' needs.

Lessons Learned: When business is not good, firms are willing to try anything. There will always be one or two people who will try to steal a customer; but clients will come back, they want fair treatment and the benefits a network of firms can provide. People are reluctant to sign forms; when you keep the network informal, you can do almost anything. Creating relationships is a slow process.

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## THE FLEXCELL GROUP

Objective: To become a full-service, vertically-integrated, single-source, top-tier network of suppliers servicing major manufacturers with product development and production capabilities.

Types of Firms: Seven firms are involved in this strategic alliance: a pattern company; a precision, small prototype machine shop; a plastics mold and tool company; a mechanical engineering firm; a contract machining firm; a marketing and management consulting firm and a quality assurance consulting and training firm. Companies range in size up to \$8 million in revenue and from 3 to 57 years of age. The five production firms all possess CAD/CAM/CNC capabilities. Four firms are located in the same building.

Membership Requirements: Trust, ability to communicate, capacity to enhance the customer's global competitiveness, fit with necessary capabilities of the group.

Governance Structure: An unincorporated group that meets once a week on management as well as project activities.

Activities: Collaboration is directed toward two objectives: supporting individual companies in their development, marketing and production efforts with customers; and marketing the group's capabilities as a vertically integrated, single-source supplier. To date, FlexCell has produced prototypes and models for two major original equipment manufacturers (OEMs). The group operates in a project mode; a lead member is assigned to each project; the strategic relationship with customer dictates how it is managed. In presentations to clients, representatives from all six firms frequently attend. Infrastructure firms (marketing and management firm as well as quality assurance) have a direct responsibility to the customer as well to others in network.

Future Plans: To add two more companies. Another firm might be started. These firms will be identified on the basis of market needs.

Funding: Self-funded, sweat equity. No government support.

Sponsors: The firms themselves.

Broker: Facilitation function is fulfilled by one of the participants who operates the marketing and management consulting firm.

Genesis: In January 1991, owner of pattern firm and her consultant developed networking concept as growth strategy. They were then approached by a 3-year-old start-up company with which they wanted to link up. Management consulting/marketing firm, which was serving as a consultant to the original firm, joined the network as the third member. In looking for a firm with CAD/CAM/CNC capabilities, the group found a person who had developed a mini-network to support his own firm. His affiliation evolved over coffee.



**Challenges:** Unified vision, personalities, corporate culture, maintaining focus and momentum, managing relationships, project management, educating large clients and overcoming their resistance to this type of operation, learning to work via a mode of least resistance.

**Success Factors:** Trust, the focus on both short-term and long-term survival, utilization of available technology for client solutions as well as group communications, group consensus, patience, respect for the viewpoint of others, faith that a network can work.

**Lessons Learned:** Networks do not necessarily get started by getting grants. Firms must anticipate the customer's needs and provide superior service rather than their other options. Firms must understand global competition and the customer's situation. Communication within the group must be sincere and from the heart. Creative sparks are generated by these types of relationships. The connection to the market can't simply be assigned to a broker.

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## **FLEXIBLE MANUFACTURING NETWORK PROJECT**

Objective: Group purchases, joint marketing, employee training.

Types of Firms: Seventy manufacturers in the rural tri-State area of Minnesota, South and North Dakota, that produce a broad range of products in metals, plastics and wood. Range in size from two to several hundred employees, the average is 20. There are 30 to 40 associate members, e.g., banks.

Membership Requirements: Must be a value-added manufacturer (rather than a processor of raw material). Dues for firms with more than 10 employees are \$50; with less than nine, \$25. Associate members are charged \$50.

Governance Structure: A nonprofit organization with a five member board of directors and one ex-officio member. Board serves as an executive committee and provides the management structure for the network. Board as well as general membership meetings are held monthly. Staff consists of CEO, network services representative with responsibility for day to day links with membership and an administrative assistant. A for-profit subsidiary is being established through which to funnel new ventures and profit-generating activities.

### Activities:

1. Monthly membership meetings rotate to various cities and are designed to provide information (e.g., guest speakers), promote discussion and provide opportunities to network. They are held in the evening, beginning 1 hour before dinner. These meetings allow 45 minutes for the meal, 1 hour for group discussion or presentation and time afterwards for networking.
2. A joint purchasing program has been established with a buying service in order to reduce costs of production, maintenance and office supplies. Seven companies participate, resulting in 20 percent cost savings.
3. A long-distance telephone program has been created, resulting in savings of up to 50 percent. Half the network members participate.
4. A cooperative marketing program is being developed in order to exhibit at national trade shows.
5. Provides grants for training in order to mitigate employers financial burden; offers seminars on various production issues.

Some businesses would not have survived without the network. Lots of interactions are occurring and the network is expanding.

Future Plans: To initiate a membership campaign; to establish a marketing arm on behalf of network firms and broker the network at trade shows; to encourage members to become ISO 9000-qualified (a set of international quality procedures); to develop the in-house capability to teach and accredit firms on quality standards; to become self-sufficient within 2 years.



Funding: A 3-year grant from Northwest Area Foundation at \$100,000 per year. A \$25,000 per year grant for special projects from West Central Minnesota Initiative Fund for training, marketing and office equipment. When marketing arm is established, network will earn a finder's fee (from 3 percent to 10 percent) on any sale it makes on behalf of the firms.

Sponsor: Tri-State Manufacturers Association.

Broker: A manufacturer with a marketing background; operates as CEO of the network.

Genesis: The idea for a network was initiated in 1988 by a dozen manufacturers who believed that business could be kept in the area by working together. Monthly meetings were instituted, others recruited by word of mouth, a plan developed, a grant obtained and a CEO hired by November 1990.

Challenges: An insufficient number of firms with high-quality production. Overcoming the competitive mindset, apathy and a lack of urgency among firms.

Success Factors: Member-initiated and -driven. Network has filled an obvious need for people to work together.

Lesson Learned: Need to be member-driven.

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## **FURNITURE NEW YORK (FNY)**

Objective: To develop and market high-quality contemporary furniture and accessories domestically and internationally.

Types of Firms: Twenty-one firms in the New York City area (20 furniture makers/designers and one show house). They range in size from two to 15 employees.

Membership Requirements: Must be a designer of original, high-end contemporary furniture and accessories and be willing to work collectively. Initiation fee is \$250, annual dues are \$500. Associate and student memberships exist.

Governance Structure: A not-for-profit organization with a board of directors. The network meets once every 6 weeks. Several committees have been established.

### Activities:

1. Marketing by collectively exhibiting at both domestic and international trade shows. In April 1991, eight of 14 firms exhibited in a single booth at Milan's Salone del Mobile, one of the world's most prestigious contemporary furniture fairs. As a result, the cost to each participant was only between \$2,500 and \$7,000 as compared to \$35,000. Firms have also gained credibility in the United States and have begun to establish an identity for U.S. designers in Europe. They returned with over 200 serious customer leads and 70 press contacts. Several actually closed sales at the show. FNY firms have also exhibited as a group in Tokyo, in Cologne and at several domestic shows. FNY is exploring the possibility of setting up exhibits at key retail stores in major European cities.

2. Developing a local production network with New York's specialized trade manufacturers to lower production costs, increase quality and secure reliable production (most production of member firms is subbed out to manufacturers in and outside of the region). Through a \$25,000 grant from the State, two consultants (an architect and an engineer) were hired to evaluate and qualify local suppliers. Designers were interviewed about their manufacturing needs, and 120 suppliers were surveyed out of a potential field of 5,000 in New York. Sixty firms met the criteria and information was collected for inclusion in a database. A meeting between design firms and manufacturers was held in January in which eight suppliers attended. The network is looking for ways to develop relationships and improve production capabilities (e.g., training seminars). In spring of 1992, FNY received an additional grant to advance the supplier network to the next phase of development. The money will be used to hire a consultant who will market the design and production capacity of New York City firms to regional public and private organizations.

3. Working with a loaned New York Telephone executive to develop a business plan in order to raise capital.

A great deal of sharing is occurring among competitors.

Future Plans: To obtain a grant to hire a coordinator. To raise capital for a marketing program.

Funding: Port Authority New York/New Jersey provided \$8,000 toward the cost of the Milan show. These funds were drawn from XPORT's Harvard Innovations Award which was initiated to help industry groups develop export markets. Firms have spent approximately \$35,000 to \$40,000 collectively on the Milan exhibition and a similar amount for Cologne and Tokyo as well as \$20,000 on several domestic shows. There have been several other projects for which firms have been asked to contribute money. New York State's Industrial Effectiveness Program (funded through the State's Department of Economic Development) has provided \$12,000 to the Port Authority to conduct a study of contemporary furniture and export potential, \$25,000 for the supplier study and \$20,000 to promote the development of the supplier network. Over \$100,000 of unpaid work has been performed by Port Authority staff.

Sponsor: NY/NJ Port Authority.

Broker: As manager of the Port Authority's XPORT Wholesale program, she works with trade associations, industry groups and government agencies to promote international trade.

Genesis: In 1989-1990, a local designer firm pursued government support for her firm and industry. She convinced the State to fund a study of the local contemporary furniture industry. The Port Authority conducted this study which concluded that the industry has a large export potential. A group of firms was organized by Port Authority staff to attend the Milan show and to collectively address industry problems.

Challenges: Managing the network and the flow of communications among firms, lack of time for business and network needs, lack of resources, deteriorating firm financial conditions and some signs of burnout on the part of participating firms.

Success Factors: The motivation provided by the recession, good designers, persistence, driven co-chairmen.

Lessons Learned: A network requires enormous time to develop. Commitment is required on the part of industry; government alone is not sufficient. Industry groups need an objective outsider to help them get organized and to keep the peace.

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## **GARMENT INDUSTRY DEVELOPMENT CORPORATION (GIDC)**

Objective: An industry specific service center established to serve New York City's garment firms for training and education, market research/support and technology assistance.

Types of Firms: GIDC serves the complete range of contractors, manufacturers and design houses involved in the women's apparel industry. GIDC's constituency consists of an estimated 800 firms.

Membership Requirements: Firms associated with the trade associations or the union represented on the GIDC Board of Directors.

Governance Structure: A nonprofit organization with a 16 member board of directors. Five members each from the City of New York, the major trade associations and the International Ladies Garment Workers Union (ILGWU) as well as the President of New York's Fashion Institute of Technology.

### Activities:

Training--GIDC operates five training programs and develops employer-specific training when appropriate: (1. sewing machine maintenance and repair for small contractors and middle management; (2. computer assisted shop floor management; (3. basic skills in manual marking and grading operations; (4. training in computerized marking and grading for workers who cut fabrics; (5. Advanced training in a wide range of skills such as whole garment construction and quality control for experienced sewing machine operators. GIDC opened a new training center in October 1989, and programs are held there or at the Fashion Institute of Technology. Each year GIDC provides training for over 200 individuals. More than 1,000 have already been trained.

Technology Assistance--GIDC helps firms select new equipment or improve operational efficiency by arranging visits by engineers from the Industrial Technology Assistance Corporation or the Fashion Institute of Technology.

Marketing--GIDC has undertaken a comprehensive marketing and technology assessment entitled Keeping New York In Fashion that was presented in March 1992. On the domestic side, GIDC is establishing quick-response partnerships among retailers, manufacturers and contractors in order to create a Women's Apparel Industry Supplier Network. Internationally, GIDC, in partnership with the Council for American Fashion, created Fashion Exports/New York (FENY) in September 1991. In addition to seminars and consulting services, FENY helped organize a women's apparel buying mission for a group of Japanese buyers in October 1991. GIDC is also working to organize participation in the major European and Japanese apparel shows.

Future Plans: GIDC is working to develop a comprehensive technology extension and demonstration capacity. GIDC is also completing an Employer Needs Assessment with over 100 firms to update its training and marketing efforts. Based on the recently released Keeping New York in Fashion, GIDC is working to establish a Women's Apparel Industry Supplier Network.

Funding: 1992 budget is \$983,000. The three main sources of funds are the City of New York, the trade associations and the ILGWU. New York City Department of Employment provides over \$200,000 per year of Federal monies passed through the city for training. New York State is a major source for project specific funds and has funded FENY and the initial phases of the Women's Apparel Industry Supplier Network. GIDC does not charge fees for service.

Sponsors: The New York Skirt and Sportswear Association; the Greater Blouse, Skirt and Undergarment Association; the Apparel Manufacturers Association; the New York Coat and Suit Association; the National Association of Blouse Manufacturers; the International Ladies Garment Workers Union (the national and several locals); the New York City Department of Business Services and Office of Economic Policy and Marketing.

Broker: GIDC has six full-time staff and six additional staff associates. All are "brokers" in the various areas of expertise, e.g., training, technology transfer, marketing, etc.

Genesis: The largest manufacturer in New York City and the second largest in the State, the garment industry employs over 100,000 in the city and provides over 70,000 related jobs. In 1984, a tripartite organization consisting of representatives from local government, industry and labor was created to address competitive problems in an industry characterized by numerous small firms and adversarial relationships. For example, individual firms in this industry do not train employees, because they always walk out the door. GIDC has grown to provide a full range of training, technology and marketing services.

Challenges: To constantly demonstrate the viability and contributions of the center's efforts.

Success Factors: The active participation of government, labor and industry; tripartite, yet industry-driven.

Lessons Learned: Labor/management cooperation is essential to a comprehensive economic development approach because it prevents mistakes and provides a basis for implementation, particularly on the shop floor. User fees create barriers to service utilization. Complete self-sufficiency of industry service centers is a mistaken objective; all of the Italian service centers still rely on public funding. To speed the dissemination of technology, technology assistance must be linked with market opportunities.

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## **GREATER SYRACUSE METALWORKING INDUSTRY (GSMI)**

Objective: Joint marketing of area metalworking, plastic and mold-building firms.

Types of Firms: Forty metal and plastic working firms in the greater Syracuse area.

Membership Requirements: Firms should preferably be members of the local chapter of the National Tooling and Machining Association (NTMA). There are no dues.

Governance Structure: A coordinating committee made up of six chapter members appointed by the association meets once a month to oversee project. Functions as a not-for-profit consortium.

Activities: Sales literature with detailed capability information has been prepared. The sales director is responsible for attending trade shows and making sales calls throughout the country. When job specifications are received for quote, staff writes a brief description, then the specs and description are faxed or hand-carried to all network members with the necessary capability. Interested members must respond within 24 hours. Those firms are given complete specs and blueprints. Quotes are sent directly to the customer from the individual firms, and subsequent purchase orders are directed to the member company. GSMI sales staff follow up quotes with sales calls to client companies to encourage them to use GSMI firms and to assist in the information flow between the members and the customer. This may include reworking designs, arranging company visits, helping network companies develop quality control paperwork to meet client needs, providing network facility lists as requested by clients, etc.

If a firm receives a request for quote that it can't perform, it is to get the buyer's permission to have other firms quote and forward to the GSMI sales office. A gentleman's agreement exists that firms will use fellow firms for subcontracts when possible. The number of job quotes processed by the network in 1991 was 642; sales for that year were \$1.6 million.

The network has set up classes at Onondaga Community College in quality control, statistical process control and just-in-time. Shop owners as well as foremen and hourly workers have been involved.

Future Plans: Continuation of current program, working to fine-tune the process, developing smooth working relationships with client companies. To expand sales territory and develop new clients. To become self-sufficient.

Funding: The network was seeded by an initial grant of \$100,000 from U.S. Economic Development Administration, \$50,000 from New York State Urban Development Corporation and several contributions of \$7,500 from National Tooling and Machining Association member companies to carry the program between Federal and State funding lags. Firms pay network a commission of 5 percent on all orders received. Membership fees are being considered. All State and Federal support ended in early 1992. The program is now positioned to become self-sufficient based solely on commissions received from GSMI network company orders.



Sponsor: Central New York chapter of National Tooling and Machining Association.

Broker: Thirty years' experience in industry sales.

Genesis: NTMA member-shop owner gave a speech on networking at a local business dinner. Pointing to the cooperative efforts in Europe, he challenged local firms to build better relationships in order to bring in work that no one could handle alone. A staff member of Central New York Regional Planning and Development Board contacted the speaker and organized a committee to develop the idea. A proposal for Federal grant monies was written and a capability survey conducted. The program was established in 1989. A sales director was hired in May 1990. GSMI was housed and staffed initially by the local Economic Development Council. The first 2 years were dedicated to obtaining local commitment and working out the means of implementing the concept.

Challenges: The existence of competitors within the group; managing the differences of opinions, insufficient funding particularly for travel expenses to national trade shows. Important sales time that could have been spent with clients was consumed in State and Federal paperwork and in developing trust between network companies.

Success Factors: An industry champion to establish the network, A network of 40 firms working together constitutes the largest machine shop in region. The diversity of shop capabilities, their flexibility, the coordination, responsiveness, quality and one-stop shopping are attractive to purchasing people. There is a high level of involvement and commitment of many firms to making the project work. The sales director's pre-existing knowledge of shops' capabilities and potential client matches assisted in speeding network start-up under poor economic conditions.

Lessons Learned: People will stay involved when they have to make a financial investment.

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## **HEAT TREATING NETWORK, INC. (HTN)**

Objective: To promote technology transfer and operational improvements in the heat treating industry.

Types of Firms: Consists of 21 heat treating firms and six university technology providers.

Membership Requirements: Dues are \$1,000 per year for firms with sales of \$5 million or less, plus \$100/per million dollars of sales up to a maximum fee of \$10,000. Nonprofits are admitted at no cost. Participation is voluntary. As of October 1991, HTN is open to membership nationwide as well as to medium-sized and large firms, government agencies, universities and tech centers. HTN is seeking to include captive and commercial heat treaters and equipment suppliers.

Governance Structure: A nonprofit joint venture between Heat Treating Network, Inc. and Edison Material Technology Center (EMTEC), the board consists of three directors from each organization, elected to staggered terms. The board provides business/technical review of activities and meets as needed.

Activities: Core program consists of a free hot-line service at the Edison Center which provides technical assistance. Service will deliver a solution within 72 hours or help firms access other resource providers. Members have unlimited access, non-members can try the service once. Twenty-four companies have received informational as well as operational support. One member overcame a failure in producing a newly designed part, which saved him a \$50,000-a-month customer.

HTN has established an environmental services program for the industry, an applied research project on distortion during heat treating and five technical focus groups in the areas of process controls, quality control, surface treatment, equipment maintenance and the treating of gray and ductile iron.

HTN meets once every six weeks or two months. Membership meetings will be conducted on a regional as well as national basis. Interaction among members has been informal.

HTN has a cooperative relationship with the Metal Treating Institute, a trade association for commercial heat treating in the metal trades, which has 365 members. The association represents 10 to 20 percent of the industry and does not include equipment manufacturers. Another association, American Society of Metals International, was started in 1918. One-half of their members have an interest in heat treating. However, the association is educationally oriented and is not involved in technology transfer activities.

Future Plans: To diversify membership and to become self-sustaining. HTN has begun to align itself with more than one tech center.

Funding: Ohio's Department of Development provided a 2-year matching grant for \$286,000 in 1990. HTN planned to raise \$75,000 in membership dues and received \$100,000 from the Edison Center. In the future, HTN will operate under the auspices of the Edison Center and be included in their budget.

Sponsors: Edison Material Technology Center, Kettering Ohio, Cleveland Advanced Manufacturing Program, Environmental Services Program.

Broker: a marketing consultant with industry knowledge who serves as president.

Genesis: The current organization and set of activities, started in 1989, was the outgrowth of efforts in the mid-1980's to assist heat treating firms that were customers of East Ohio Gas (who sponsored those efforts and provided approximately \$20,000 in funding), and is comprised of many of the same firms.

Challenges: The recession, difficulties of a start-up, identifying captive heat treating firms and their leadership, developing and selling the concept of a network.

Success Factors: Core group of committed firms, entrepreneurial leadership, consistent financial and managerial support, alliance with a reputable technical center, expanding academic affiliations, State matching financial support.

Lessons Learned: Networks are breaking new ground, the start-up phase takes longer than expected, time is required to create trust, a network needs a champion and core activists, the facilitator must make a commitment to the program.

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## KENTUCKY WOOD MANUFACTURERS NETWORK

Objective: Joint marketing and the adoption of advanced technology by Kentucky's wood products industry.

Types of Firms: Seventeen wood products firms throughout Kentucky.

Membership Requirements: Open to all wood products firms with production facilities located in the State. Firms have voluntarily made membership contributions.

Governance Structure: Incorporated as a nonprofit entity.

Activities: In September 1991, three network firms attended the International Wood Manufacturing Machinery Show in California to display their products. Several firms have begun to network together on a number of projects that none could perform alone. In particular, four firms are jointly working on a project in Florida worth \$2 million. Network hosted a wood industry software evaluation seminar at a production facility to demonstrate emerging CAD/CAM applications programs. Several software companies have agreed to donate software for evaluation to firms for up to a year.

Future Plans: Identification of industry needs and the development and implementation of programs over next 3 years. The goal is to promote networking and collective activities among a targeted 600 firms. Planned initiatives include: (1. the creation of a database and an electronic marketing/CAD interface linking wood manufacturers with customers like architecture firms; (2. development of a national and international marketing plan and staff to implement it; (3. demonstration and training in advanced technology at firm sites, as opposed to university centers; (4. The development of product design and engineering capabilities; (5. encouraging the adoption of modern manufacturing systems and production techniques. The network expects to attain self-sufficiency through membership fees, commissions from sales and wood industry trade shows and fees from underwriting self-insurance programs.

Funding: A \$75,000 grant from the Kentucky Department of Economic Development to initiate the network has been approved. The Southern Technology Council recently provided a \$10,000 demonstration grant to assist in the development and implementation of an electronic information exchange vehicle to allow firms to share market, product design and manufacturing specifications in real time.

Sponsors: Kentucky Science and Technology Council, Southern Technology Council, Kentucky Department of Economic Development, Eastern Kentucky University Center for Economic Development, University of Kentucky Department of Forestry, University of Kentucky Center for Robotics and Manufacturing and University of Louisville Telecommunications Research Center.

Broker: Owner of a custom architectural millwork shop.

Genesis: The State is the fourth leading exporter of hardwood in the United States. Kentucky has 1,000 wood products firms, 500 in the primary and 500 in the secondary sector. The broker learned about the networking concept and helped to organize a day-long conference in April 1991. Of 30 participating firms, 17 joined the network. In November 1991, a formal entity was established with those members placed on a 6-month interim board whose purpose was to set a mission and train staff. At that time, the membership will be opened up to entire State and a permanent board of directors will be elected. The objective is to set up six geographical hubs in regions of the State. The network has held three organizational meetings.

Challenges: Funding, inconsistency of State policymakers, lack of resources and time from industry, infighting among State universities, changing the individualistic mindset and philosophical attitudes of entrepreneurs.

Success Factors: The energetic support of firms that comes from their understanding of how collective participation can help them overcome barriers to continued growth and development.

Lessons Learned: Focus initial activities on issues likely to have the most positive impact on firms. Win one firm at a time with positive experiences and then follow with more ambitious activities. Maintain industry lead of program development; resource agencies can lead efforts astray. Plan initial activities around existing resources so that momentum will not be interrupted due to unreliable resource providers. Be prepared to deal with trade associations that might feel threatened by some activities that they feel closely mirrors their own functions. State agencies, universities and other resource providers do not generally know how to support small and medium-sized firms.

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## **KNITWEAR INDUSTRY CENTER**

**Objective:** Joint marketing, co-production of orders, improvement of quality, exchange of information, joint purchases of materials and employee training.

**Types of Firms:** A dozen knitwear producers--third- or fourth-generation, family-owned mills (German, Italian, West Indian, etc.)--located in the Greater Ridgewood area of Queens and Brooklyn.

**Membership Requirements:** Open to all New York firms in the industry. Fees are \$1,000 up front and \$300 per year. Admission is open, but members must adhere strictly to defined standards of quality and customer service; demonstrate a record of sustained, high-quality production; and participate in ongoing efforts to improve design, production, quality and service standards.

**Governance Structure:** A non-profit association. All members are on the Board. Decisions are made by consensus.

**Activities:** Beginning in 1989, the firms meet weekly at different plants to review orders in their shops, to discuss production and quality problems and to develop new programs and strategies. In May 1991, the Knitwear Industry Center (KIC) was established and an individual hired to identify new customers and jointly market firms. Brochures have been developed. The objective is for firms to stay small but capable of quick response by effectively distributing work that no single firm can handle. Work is underway to institute a Total Quality Management program for member and nonmember mills.

**Future Plans:** To expand membership to other knitting mills as well as to spinners and machinery dealers as associate members; To jointly purchase commodity products; to design; to produce a proprietary line of sweaters; to jointly market domestically and internationally; to establish a permanent site for knitwear center and establish joint facilities such as a warehouse, training facility and showroom for designers/public. To achieve self-sufficiency over the next year.

**Funding:** Over the past year, \$25,000 from New York City and Queensborough President and \$25,000 from firms. Financial support has also been received from banks and equipment companies. The network will receive \$50,000 in 1992 from New York State to implement a Total Quality Management program for the industry. Self-sufficiency will be achieved through an increased number of participating mills.

**Sponsors:** Queens Overall Economic Development Corporation, Ridgewood Local Development Corporation, Office of the Queensborough President, New York City Department of Business Services, New York State Department of Economic Development.

**Broker:** Background in economic development. The network hired a marketing director with extensive industry experience and contacts.



Genesis: Over 500 knitwear firms in New York City represent 10,000 jobs. In 1989, several firms approached the local development corporation for assistance in obtaining financing for new equipment. As a core group of firms began to meet weekly, other problems were discovered and began to be addressed collectively, starting with training courses in total quality.

Challenges: To promote cooperation among firms perceived as competitors. To encourage firms to join before success can be demonstrated. To encourage firms to change and adapt to new market conditions.

Success Factors: Current members are pragmatic, participative, neighborhood-focused as well as young and looking to make their mark. There is a strong ethic of cooperation: firms have given each other their customer lists. Network is industry-led with the broker's role as paid staff for network.

Lessons Learned: Every industry is very different, and the approach taken has to be adapted to particular conditions. Philosophy and models must be kept in the background; the focus must be on the bottom line and on particular problems. The costs of consultants and experts, even on a subsidized or group share basis, are too high for small firms. The network's philosophy is that each of the firms have 80 percent of the solution to their problems. Firms learn by communicating, and this is the source of the network's value.

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## LEHIGH VALLEY APPAREL AND TEXTILE NETWORK

Objective: To address problems in the region's apparel and textile industry through labor/management cooperation, training and technology adoption.

Types of Firms: There are four industry participants (two associations and two unions): Atlantic Apparel Contractors Association (AACA), Valley Apparel and Textile Association (VATA), Amalgamated Clothing and Textile Workers Union (ACTWU) and the International Ladies Garments Workers Union (ILGWU). Fifty firms have been involved in various activities.

Membership Requirements: None.

Governance Structure: The steering committee, which has met on a monthly basis for 3 years, consists of representatives from both associations and unions as well as from the Manufacturers Resource Center (part of PA's Industrial Resource Center program), Lehigh University, Northampton Community College and Northampton Vocational-Technical School as well as several lead firms. An executive committee is being established to manage the network and provide policy as well as budgetary control.

Activities: A strategic audit was undertaken to identify how changes in the apparel industry affect local firms, to describe how successful firms are competing, and to use that information to develop a strategy for local industry. From a survey of 3,200 employee exits, it was learned that 60 percent left voluntarily, 50 percent over issues of treatment. This changed the industry's focus from recruitment to retention. Training programs for plant supervisors and their union counterparts have been developed by AACA and ILGWU and are being implemented in 15 firms. Over 100 people have attended.

Two companies were selected to implement pilot programs for joint labor-management efforts to improve quality and productivity during the second year. One developed a joint planning and problem-solving model for reducing the throughput time of special orders, which involved the establishment of joint labor-management groups at all levels of the organization. The second implemented a joint labor-management quality system and collaboratively identified and approved a rate-setting system, creating a computer-based software program to assist in this process.

Other activities include the establishment of an entry-level training program with Northampton Community College to recruit unemployed and disadvantaged workers and the development of an award-winning technology seminar series and videotape to introduce new technology to contractors.

Future Plans: To convene marketing seminars and supervisory training programs, to develop additional pilot projects, to diffuse lessons learned to other firms, to establish a technology users group.

Funding: Three years of funding was received from Pennsylvania's Department of Commerce Manufacturing Innovation Networks Program for \$80,000 in 1989-1990, \$60,000 in 1990-1991 and \$40,000 in 1991-1992.

Contributions of over \$36,000 have been received to date from associations, individual firms and the unions.

Sponsor: Pennsylvania's Manufacturing Innovation Network Program. See also Governance Structure.

Broker: A labor management specialist.

Genesis: There are approximately 250 local firms in the apparel and textile industry, representing a significant percentage of the manufacturing base. In 1989, the organizations represented by the steering committee were organized by the broker and submitted a proposal to form a network in response to a State competitive request. The first year to 18 months involved having traditional adversaries work together to create a common mission. The broker was the driving force. By the end of the second year, a transition has begun with industry assuming more control.

Challenges: Obtaining company participation; overcoming adversarial relationships among firms and between nonunion/union shops; increasing trust; determining the appropriate role of the players; understanding what it means to be industry-driven when industry doesn't always know what it needs.

Success Factors: Economic pressure (a force for change as well as a constraint). The union as a valued partner and a source of institutional continuity.

Lessons Learned: The key to building trust is to get firms engaged in projects and create some successes. Must encourage the networking process without creating dependency. Just because firms are small, doesn't mean networks are appropriate. It takes time to figure out where the network can add value. Networks are often top-heavy; they must quickly move beyond associations to the level of the firm. When working with State funds, it is important to find ways to build local ownership and self-sustenance.

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## LOUISIANA FURNITURE INDUSTRY ASSOCIATION

Objective: To enhance the competitiveness of existing firms by joint marketing, training, and joint production.

Types of Firms: Ninety-seven members in the rural areas of three States: Louisiana, Mississippi and Texas. Seventy-five firms build mostly high-quality, limited edition furniture for residential and commercial customers or are part of the supply network.

Membership Requirements: Must be a furniture manufacturer or a supplier, retailer or consultant to industry. Dues are \$100 per year. There are two categories of members: active members can vote, associate (consultants or out-of-State firms) cannot.

Governance Structure: The not-for-profit organization has four officers, eight district directors and one at-large director on its board plus various standing committees. The board meets monthly, the general membership annually. Steering and standing committee meetings are open to the general membership and are held prior to each monthly board meeting.

Activities: In May 1991, the association opened a 222 square-meter (2,500 square-foot) Furniture Gallery in Hammond Louisiana, in which 35 firms display their products. The space, an old bank building that was renovated by members, also serves as association offices. The showroom is open Tuesdays through Saturdays from 10 am to 5 pm. Rents are \$16.88 per square meter (\$1.5 per square foot), \$2.5 for accessory items, \$2 to \$5 for art. The association takes no commissions but brokers inquiries, markets for firms, displays promotional materials, and offers to show photo albums and brochures for those members not exhibiting. The showroom, which opened in June 1991, had its best week in January 1992 with \$12,000 in sales made by referrals. An estimated total of \$60,000 to \$80,000 in sales have been made by referral--only about \$6,000 of which came directly off the floor, since most people are looking for custom pieces.

A production network is beginning to develop. Two retail businesses in New Orleans expressed interest in developing a line of furniture whose price points no single firm could meet. By focusing on their specialties, a group of 16 to 18 firms are trying to get the cost down.

A vocational-technical curriculum for woodworking occupations that was developed by the association has been put in place in two schools and recognized by the State.

Communications are maintained through conferences, seminars, workshops and newsletters. The network is evolving and individuals are being exposed to opportunities.

Future Plans: To organize a trade show in New Orleans. To develop a working capital loan pool. To identify uses and export markets for scrap wood.

Funding: Donations, dues and sponsors. Six-month and 1-year sponsorships are available for \$500 and \$1,000 respectively which have generated between \$5,000 and \$6,000.

Sponsors earn space in showroom for their logo and on all association materials. Association has received 6 months' free rent from the Hammond Downtown Development District for the showroom and headquarters. Most funding is provided by the membership; members have also contributed \$17,000 worth of direct and indirect costs toward the renovation of the showroom; contractors had bid \$35,000 for the work. The executive director only works part time. The association has received a \$25,000 grant from the U.S. Economic Development Administration to study the industry in the State.

Sponsors: Self-sponsored.

Broker: An M.B.A. with experience in economic development and working with small business.

Genesis: In the fall of 1988, the broker began to investigate various manufacturing industries in which small firms predominate. He organized a seminar for firms in the woodworking sector in July 1989 to identify the major issues they confront. Over 180 people attended. Seven areas emerged: marketing, education, political activities (i.e., environment, regulation and taxes), information dissemination, productivity improvement, incubator development and membership benefits (i.e., to increase networking, develop insurance programs, etc.). An organization was formed to address these needs. The first steering committee meeting of six firms was held in August 1989.

Challenges: To overcome fear, doubt, mistrust and secrecy among firms; to demonstrate benefits to small firms which operate in survival mode; to educate the public and the government about the benefits of networking as compared to "sexier" approaches like business attraction; to establish credibility; to obtain funding.

Success Factors: Core of committed people, involvement of the local public sector (e.g., providing incentives by foregoing licenses and fees, encouragement), a champion with drive and dedication that can interact with industry, a well-defined program, perseverance and good public relations.

Lessons Learned: Developing a network is tough. The network must clearly understand what it is and where it wants to go in order to present itself credibly to the public as well as assess its competition and identify obstacles and opportunities. Must start to organize the region before focusing on the entire State. People are the most important factor. Execution is critical.

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## **MAHONING VALLEY ALUMINUM EXTRUDERS NETWORK**

Objective: Quality improvement, waste management, training.

Types of Firms: Seven aluminum extruders, eleven tool and die firms. This region has the richest concentration of tool and die companies (46) for extruders in the world.

Membership Requirements: None.

Governance Structure: Informal. Regular monthly meetings.

Activities: The first few sessions generated 25 project ideas and priorities in six different categories: (1. process control and product quality, (2. environmental waste stream management, (3. training for the first two categories, (4. database of members' technical capabilities, (5. tool and die projects, (6. expansion of membership. The network has developed a 24-month operating plan to address these areas. Projects have been initiated.

No tangible benefits or outcomes have been produced yet. The foundation of the network has been laid. Interaction among firms is taking place in and out of meetings. Firms have developed a sense of ownership about the network; at first the broker was moderating meetings, now they have elected a chairperson for that purpose. Broker will manage network activities and leverage outside funds and free resources.

Future Plans: To prove the viability and value of the network concept first and then to address the issue of self-sufficiency and investment of the part of the firms. To expand network membership into related industry sectors.

Funding: Network received a matching grant from the Ohio Department of Development for \$200,000 over 2 years. The five founding firms each contributed \$20,000 in sweat equity. The broker's time is donated to the network by the sponsor.

Sponsors: Regional Growth Alliance, a local economic development organization covering a three-county area in Ohio.

Broker: A background in manufacturing technology, an M.B.A. and 15 years of industry experience.

Genesis: Responding to the State's request for proposal, sponsor looked for industries with lots of small and medium-sized firms that were adversely affected by the decline of the steel industry. Aluminum extruders fit the criteria, and those that remained are financially sound--firms are running shifts during weekends. A proposal was submitted and a grant received in November 1990. The broker began March 1991. Identified 11 extrusion firms through a directory search, conversations with local economic development agency and interviews with suppliers to and customers of extruders. All 11 were contacted personally; five became active members, two passive. Two said no for economic reasons and two firms had policies against networks. Two firms have changed management and will joining the network.



Challenges: The diversity of firms, while beneficial, makes network more difficult to manage. Bringing competitors together and changing their mindset.

Success Factors: The dynamics and openness of owners, the small size of the group, the broker's energy and efforts to minimize frustration level for firms and to do the preparation work for meetings.

Lessons Learned: It's difficult for the broker to come into the picture after the grant has already been awarded. Companies must feel ownership of the network.

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## **MANUFACTURING INNOVATION NETWORK PLASTICS INITIATIVE**

Objective: To promote initiatives such as joint marketing among local plastics manufacturers.

Types of Firms: Between 70 and 80 plastics and related tool and die firms in northwestern region of Pennsylvania (Crawford, Erie and Warren counties).

Membership Requirements: None.

Governance Structure: An advisory board for economic development at Penn State Erie meets annually or as necessary.

Activities: A strategic audit of local firms identified four areas of concern: marketing, education, technology and environmental regulation and labor management. Some of the network's resources were directed to an expansion of existing programs in the latter three areas. Most of the network's new programmatic efforts focused on marketing. In order to market the production capabilities of area firms, a directory of 55 companies has been developed. A five-company marketing trip to Canada was organized, and several more are being planned. A consultant has been hired to develop a model for a cooperative sales force among 10 small firms. Once the model has been implemented, additional participants will be sought. Five different companies, affiliated with the Plastics Technical Center, have begun to work together to produce a new product.

Future Plans: To develop a marketing brochure; to produce a second directory with 150 companies; to use the Plastics Technical Center as a magnet to attract different types of high-technology companies to support the plastics industry; to expand industry participation.

Funding: Three years of funding was obtained from Pennsylvania's Department of Commerce Manufacturing Innovation Networks Program for \$90,000 in 1989-1990, \$60,000 in 1990-1991 and \$25,000 in 1991-1992.

Sponsor: Northwest Pennsylvania Industrial Resource Center, Inc.

Broker: Plastics Technical Center at Penn State Erie. The baccalaureate program in Plastics Engineering Technology also provides an outlet for the implementation of network initiatives.

Genesis: The over 140 plastics firms in the region employ 30 percent of the total manufacturing workforce. Most of these firms originated as spinoffs of one company founded in the 1920's. Many of the tool and die shops also descended from a single company. A tradition of collaborative relationships exists, as many companies have helped others get started. In 1984-1985, meetings with plastic company CEO's indicated a need for a 4-year educational program for plastics engineers. Subsequently, a technology center was established and a 2-year plastics engineering program is currently under development. The opportunity to develop a network program arose out of a critical mass of activities already occurring in this industry and the Manufacturing Innovation Grant program initiated by the State.

Challenges: No champion or entity in place to do or promote the marketing of the industry. Continuation of funding.

Success Factors: A track record of experience and successful projects in the industry, a tradition of collaborative relationships among firms, the presence of several industry champions or trade groups in the education and technology arenas (e.g., the Society of Plastics Engineering).

Lessons Learned: Have a few key industry people attract additional participants. Network projects must be pushed within the industry first and then into public agencies. Labor-management issues can be very divisive. Having some industry activities in place already, helped to build project momentum. Starting an industry network from scratch takes a long time and a great deal of resources.

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## **MECHTECH, INC., BALTIMORE**

Objective: Apprenticeship training in precision metalworking.

Types of Firms: Fifteen metalworking firms in the Baltimore area participate in the program.

Membership Requirements: Firms must be capable of and willing to provide relevant training.

Governance Structure: A nonprofit corporation with a seven-member board of directors, five of which are machine shops, one legal counsel and one ex-officio member from the community college. The corporation licenses the program from an organization in Rhode Island that developed the delivery system for use by local metalworking shops. The program requires the participation of a consortium of firms linked with a community college.

Activities: Mechtech is a 4-year, 8,000-hour apprenticeship program in which trainees work at 16 locations for 3 months each. Locations may be repeated as long as individuals are assigned to different parts of the shop during each rotation. Trainees are on Mechtech's payroll and the corporation subcontracts them to participating shops which are prohibited from hiring them out of the program. Mechtech bills firms at the prevailing wage rate (which is the same in each shop) plus a markup which covers program costs and trainee fringe benefits.

Apprentice applicants are screened through a written test (Equal Employment Opportunity Commission approach) and a personal interview with a member of the board of directors. The ongoing monitoring process includes quarterly meetings consisting of three segments: a session with the program director and trainees in which experiences are reviewed and evaluated; a session with the company representatives to share thoughts; and a session between the firms and the program director in which reports are exchanged.

Training focuses on acquiring competencies. Each firm must identify competency achieved from a skills list. A competency profile is maintained on each trainee. In addition to on-the-job training, the community college curriculum includes 4 years of evening classes, including summers. Graduates receive an associate's degree in computer-automated manufacturing, their State journeyman's papers and a Mechtech Certificate.

The benefits of the program are that apprentices gain a wider range of skills than they would in individual shops which occupy small market niches; they learn to adapt to different cultures and develop maturity; firms have the opportunity to preview apprentices and apprentices get a chance to know the shops.

Currently, the program has four apprentices. Not all of the 15 member firms are hiring due to the recession.

Future Plans: To expand the program throughout the State and to spread it to other industries.

Funding: Maryland Department of Employment and Economic Development provided \$30,000. The U.S. Department of Labor provided \$160,000 over 2 years. To become self-sufficient on operating revenue from the program (covering benefits and administrative costs), Mechtech needs 25-30 trainees.

Sponsor: Baltimore chapter of the National Tooling and Machining Association (NTMA). Chapter was the initiating body; not all participants are NTMA members.

Broker: Local machine shop owner.

Genesis: Program was developed in Rhode Island (see below) and is licensed by Mechtech, Inc. Several years ago, a presentation was made at local NTMA chapter meeting. Baltimore program was formally chartered in spring 1990; the first class began in October 1990.

Challenges: Company concerns about the caliber of trainees and worry about spreading their tricks of the trade to other shops.

Success Factors: A champion.

Lessons Learned: The project is time-consuming and requires lots of hand-holding. Dedicated people are needed to manage it.

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The Rhode Island program has 14 students and graduated its first class of three apprentices in January 1992.

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This network project consists of five shops.

## **THE METALWORKING CONNECTION, INC.**

Objective: Joint marketing, group services and apprenticeship training.

Types of Firms: Fifty-seven metal fabrication firms in an 18-county region of southwest Arkansas. Firms range in size from two to 80 employees, with an average of 11 workers.

Membership Requirements: Firms must be locally owned metal manufacturers. Dues are \$15.

Governance Structure: Nonprofit corporation with nine elected board members--three from each of three regions. Board meets monthly, the general membership, quarterly. Several committees have been established to direct key projects.

### Activities:

1. Joint purchase of casualty insurance--savings of 20 percent to 30 percent on premiums are expected.
2. The possibility of establishing a group health insurance program and self-insurance for worker compensation is being explored.
3. An advertising program to create regional awareness of local capabilities and a just-in-time supplier program to produce parts/sub-assemblies for the local division of the McDonnell-Douglas Corporation are being developed. The latter effort will involve establishing a bid proposal team and improving quality levels to aerospace standards.
4. An inventory of firm capabilities and a preliminary design for a demonstration Youth Apprenticeship Training program have been completed. Interaction among firms has increased; they are now familiar with one another's capabilities.

Future Goals: To expand the membership of the network to other regions of the State in order to create economies of scale for various programs.

Funding: Support for administrative and broker expenses comes from the State general assembly's allocations to university economic development centers. Network has received \$20,000 from Arkansas Science and Technology Authority for shared marketing and \$10,000 from the State for the apprenticeship program. Anticipated revenues from future shared marketing efforts will fund network administration.

Sponsors: Centers at Southern Arkansas University, Henderson State University and the University of Arkansas at Little Rock (Center for Worldclass Competition). University center directors are ex-officio members of the board.

Broker: The three brokers, who are directors of the sponsoring economic development centers, had pre-existing relationships with the firms through a Department of Defense procurement center.



Genesis: A conference on manufacturing networks held by the Arkansas Science and Technology Authority led to the idea for the network. Firms were recruited through personal networks established by university centers. The first meeting was held March 1990. Industry needs were identified and prioritized through a questionnaire administered at that meeting.

Challenges: Lack of funding; maintaining participation in the face of lags between planning and implementation; differences in motivation among firms.

Success Factors: Pre-existing relationship with firms; the brokers' private sector experiences; ability to create tangible results quickly.

Lessons Learned: Broker did not provide information.

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## THE METALWORKING CONSORTIUM

Objective: Joint marketing, training, joint purchasing, technology assessment and new product development.

Types of Firms: Thirty-two metalworking firms, ranging in size from two to 150 employees, averaging \$750,000 in sales.

Membership Requirements: Must be a metalworking firm, although not necessarily located in the neighborhood, willing to work collaboratively. Donations of \$50 to \$200 annually are requested.

Governance Structure: Members meet quarterly, subgroups meet every 6 weeks and an advisory committee of three to six firms is convened monthly.

### Activities:

**Marketing--**Consortium staff market firms by personal contacts, phone calls and direct mail in order to open doors, establish relationships with original equipment manufacturers (OEM's) and make matches between customers and consortium members. Networking among consortium is also promoted. A database of information on consortium members is distributed regularly. The consortium receives a fee of anywhere from 0 percent to 5 percent of the purchase order, for the jobs it initiates. Fees usually average 1 to 2 percent on contracts obtained for members and 3 percent on those obtained for nonmembers.

In 1991 alone, \$1.6 million in bids were placed; \$180,000 were awarded and an estimated \$100,000 additional contracts were received by firms as a result of these efforts. Twenty-one business relationships were established between consortium members and firms were introduced to 68 buyers in 43 different companies. Over four years, a total of 80 network relationships were established, \$4.1 million in bids quoted, \$400,000 in contracts awarded, \$150,000 in additional contracts received and 200 purchasers introduced.

**Training--**One course is designed to improve employees' basic skills; the second for teaching advanced shop math. Nine firms and 14 employees participate in each. A CAD/CAM Laboratory operated by the sponsoring organization will begin in June 1992 with 12 to 15 firms participating. Driven by pressure on firms by their customers for this capability. Membership plus user's fees will be charged.

**New Product Development--**Six members and two outside firms began meeting in October 1991 once every 3 weeks to explore product ideas and markets.

**Purchasing Program--**Ten firms are organizing a joint purchase agreement with a steel service center.

**Technology Assessment--**Six firms have completed an audit of their productivity and technology by the Illinois Technology Institute.

Members' needs are periodically reassessed. The sponsor has purchased a 3,060 square-meter (34,000 square-foot) building in which six manufacturers and many of the network programs are located.

Future Plans: To focus marketing efforts on several large OEM's for bigger return on purchase orders. To focus on local purchasing interests, i.e., local/regional transportation, institutional, city/State department purchase needs. To solidify new product group and have two to three product prototypes to market by end of 1992. To expand metalworking and CAD/CAM training. To make modernization services (i.e., computers, quality management, etc.) a priority for members.

Funding: A grant of \$25,000 was contributed by City College of Chicago for the development of the CAD/CAM Lab. The Local Initiatives Support Corporation provided a low interest loan of \$300,000 for the purchase of real estate. Contributions from the city, local banks, private foundations and donations from members account for an additional \$63,000 during 1990. These same organizations had provided funding in two previous years as well.

Sponsor: The Jane Addams Resource Corporation, a community development organization.

Broker: Several staff within the sponsoring organization work on the consortium. They have backgrounds ranging from public relations, marketing, organizing, sales and planning to work in the industry as a journal reporter and editor.

Genesis: In 1986, 75 metalworking companies were surveyed to identify needs and interest in working together. This sector was selected because of its predominance in the Ravenswood Corridor, accounting for 26 percent to 28 percent of the labor force, and the opportunity for high wages and skill training.

Challenges: Finding the original eight people to participate in a network, waiting for people to come around, money.

Success Factors: Persistence, patience, identifying and addressing firm needs, and aggressive and open-minded business owners.

Lessons Learned: Firms must experience networking first-hand in order to understand the benefits. Broker must continually work with firms and not push his own agenda. Initially, the network started with too many companies and too many program areas; resources were stretched and program impact suffered somewhat. After reviewing history of participation, firms were split into primary and secondary tiers requiring differing levels of commitment. Direct assistance with training issues was critical.

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## **NEEDLE TRADES ACTION PROJECT (NTAP)**

Objective: To develop and implement a comprehensive industrial strategy for local apparel firms in human resources, finance and marketing, and engineering and technology.

Types of Firms: Between 80 and 90 men's and women's apparel manufacturers, ranging in size from 10 to 500 employees. Approximately 20 to 30 actively participate in network programs.

Membership Requirements: Open to apparel firms in southeastern Massachusetts.

Governance Structure: The board of the nonprofit consists of 21 directors--nine firms as well as six union and six community representatives.

### Activities:

Human Resource Programs--Child-care services have been developed for industry employees. Training programs have been established for new entrants into the industry, cross training of current employees, English as a second language, supervisors training and technical training for employers and sewing mechanics.

Engineering and Technology--A production engineering program provides assistance in hiring and training a paraengineer. Various technical assistance and demonstration projects have been developed.

Marketing and Finance--Identifying ways to address the structural changes in the industry and to manufacture private label products. Additional projects include the publication of a surplus equipment directory, a 12-week seminar series called "Manufacturing in the 90's" and a new marketing project aimed at identifying new markets for the sewn products industry.

Future Plans: To expand successful programs, particularly the surplus equipment directory; to develop bulletin boards and an on-line fashion database; and to shift from being a facilitator of service delivery to being a service provider.

Funding: NTAP has received 5 years' worth of funding at \$150,000 per year from the State's Industrial Services Program, 1 year of funding from International Ladies Garment Workers Union for \$10,000, 1 year of funding from Bay State Skills for \$10,000 and a grant from the National Institute of Standards and Technology for \$25,000. NTAP has also received several small contributions from individual firms. Annual budget for 1991 is \$75,000 and consists of revenue from these sources as well as accumulated funds from previously sponsored activities.

Sponsor: Massachusetts Industrial Services Program.

Broker: The new executive director has worked in the industry as an engineer and was familiar with the program before assuming the position.

Genesis: Begun in early 1986, the network focused on a declining but still sizeable regional industry suffering from plant closings. The first few years involved the identification of industry problems, the development of members and relationships and the implementation of remedies, some of which were partially financed by the firms.

Challenges: Reliable source of funding, anti-trust concerns.

Success Factors: The cooperation among the members of the board. Getting individual companies to begin thinking about the future.

Lesson Learned: Success takes time.

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## **OHIO FORGING NETWORK**

Objective: Business development, joint marketing, quality improvement, adoption of new technology.

Types of Firms: Seventeen or 18 forging firms. There are a total of 63 forging firms in Ohio; most are located in the northeast of the State. Thirty have been contacted.

Membership Requirements: Must be a forging company in the State of Ohio. Currently there are no dues.

Governance Structure: A steering committee of 12 firms has been established and officers elected.

Activities: Monthly meetings, which began in December 1990, are held from 11 a.m. to 1 p.m. over box lunches. In the past, meetings had agendas, topics, subcommittees and status reports; they are becoming less structured, with more opportunity for interaction.

The network has engaged a consultant to conduct a survey of 18 firms to catalogue equipment, processes, expertise, markets and identify areas in which firms are willing to work together. Firms are looking to team up to offer customers value-added services. The goal and objectives of the networks as well as the projects necessary to achieve them are still emerging.

Business Development: The biggest problem facing members is excess capacity and their need to bring in more business. The network has started a no-quotes, hands-off meeting every other week where company representatives share requests for quotes (and the prints) to which they are not going to respond. Firms get an average of 5 to 10 request for quotes (RfQ) and usually only respond to 50 percent. Six firms brought 18 RfQ's to the first two meetings in December 1991. At least one company made a photocopy of 10 out of the 18 with the intention of responding. Several bids have been submitted and two or three awards are possible. The system has been well received.

The network has used some of its funding to link members electronically with a bulletin board and a data center. A special interest subcommittee on technology, quality and energy costs, which are as high as labor costs, has been established.

Future Plans: To expand membership among forging firms and to develop a "keep work in Ohio" program.

Funding: Ohio Department of Development provided a \$250,000 matching grant for 30 months. Matching funds were provided by industry through in-kind contributions, equipment donations and technology research contracts (paid for in cash).



Sponsors: Cleveland Advanced Manufacturing Program (CAMP), one of eight Thomas Edison Centers in Ohio. Advanced Manufacturing Center is one of five Centers under CAMP. An advisory board which meets quarterly has been formed consisting of eleven nonforging folks, (e.g., dean of Cleveland State University, the editor of Forging Magazine and the assistant director of the Forging Industry Association). Most firms are members of the association, which is headquartered in Cleveland and has 300 members nationally. The association only services broad needs of interest to all members and, according to its bylaws, can't show any bias toward any one region of country or set of firms.

Broker: Has manufacturing experience but is not a forging expert. Firms wanted a catalyst, not a forging specialist.

Genesis: Ohio Department of Development issued an request for proposal for network projects. A consultant working with forging firms suggested this sector to CAMP. Twenty-five companies in northeast Ohio were contacted and a meeting held to determine feasibility and interest. Proposal was submitted with 20 letters of support from firms. Grant was awarded in December 1990. Network was managed on a part-time basis by a loaned executive from gas company until search committee found a permanent director who joined in September 1990.

Challenges: Encouraging participation, the time pressures owners are under to operate their firms, changing forging owners' mindsets, defining the network agenda.

Success Factors: Firms with complementary capabilities.

Lessons Learned: The importance of being a catalyst and an enabler, rather than taking a directive role. To get the membership to take the lead. The slowness of the network development process.

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## **PACIFIC WOOD PRODUCTS COOPERATIVE**

Objective: Marketing, new product development, joint materials purchase, waste management.

Types of Firms: One hundred seventy-five wood products firms, employing from one to 130 people.

Membership Requirements: Must be a wood products business owned and operated in the State of Washington. Firms must apply for membership and engage in an analysis of their business (see Activities category below). One-time fee of \$20 to join. Non-wood products firms can join as associate members.

Governance Structure: Incorporated as a membership organization. A five-member board of directors meets monthly. Annual membership meeting. Broker is employee of cooperative which has four full-time employees.

Activities: To become a member, a firm must meet with co-op staff and complete a "SWOT" analysis (Strength, Weakness, Opportunity, Threat) of their business. Based on the results, the staff works with firms either to develop a product in response to a specific market need and/or to get an existing product into the marketplace. Co-op provides product development and design services. Firms are often matched with others; in one case, three different firms are involved in producing a product.

1. The co-op has selected two market segments (as result of a feasibility study) on which to focus: outdoor and institutional products. They are marketing an outdoor line which already consists of 130 products; a school line will be introduced in April 1992.

2. The co-op utilizes a number of market strategies to promote members' products: (a. Retail outlets--Two franchises were opened in November 1991, located in a shopping strip and a mall. Will be expanding product lines to include complementary products made of fabric, ceramic and glass. (b. Attendance at wholesale and retail gift shows. Appropriate for one-of-a-kind pieces (e.g., wood carvings). (c. Export opportunities (particularly in Asia) and catalogue wholesale markets, through staff and market "reps."

3. Collective purchase of materials--approximately \$120,000 of woods--has led to up to 80 percent in cost savings.

Interaction among firms is increasing. Data on outcomes to date will soon be available.

Future Plans: To inventory industrial waste stream, to retrieve waste for new high-grade products instead of chips, and to reduce disposal costs, tree cutting and product material costs. To form five satellite programs, one of which will be in Oregon. Programs are expected to become independent. Self-sufficiency is expected by June 1993--at end of 2.5 years, through commissions on product sales.

Funding: Northwest Area Foundation grant for \$150,000 over 2 years, \$50,000 from Washington Department of Community Development for 1 year and \$92,000 from Department of Trade and Economic Development for 18 months. The co-op retains a percentage of the product sales it generates. Co-op is not always the exclusive marketer for these companies. Percentage varies from 4 percent to 12 percent according to the effort necessary to market the product; 25 percent if retailed through mail.

Sponsor: Self-sponsored.

Broker: Has a marketing background, is fifth generation of family in wood industry and has spent 5 years in Asia.

Genesis: In 1985-1986, the decline of local timber industry motivated broker to look for alternative means of employing the skilled labor and forestry resources of region. Obtained a \$12,000 grant from Lewis County Economic Development Council to conduct a 1-year feasibility study in order to determine the number of people who were skilled and capable of small manufacturing, analyze markets for wood products and design organizational structure for network. County created an advisory committee. Cooperative formed in September 1990.

Challenges: Overwhelmingly favorable response created excessive demands on staff to conduct the producer conferences which are part of the membership process. A couple hundred firms are waiting to join. Administrative systems (record keeping, payments and material handling) had to be designed that, unlike conventional ones, work under multiparty circumstances.

Success Factors: Market orientation, the ability to respond flexibly to market needs, market expertise, industry background, providing services that small businesses are unable to obtain themselves.

Lessons Learned: Network idea has been resisted among small firms because Americans have tried to emulate the Europeans. It is not necessary for firms to share all resources or engage in full financial disclosure in order to work together. Need to approach firms in the right way. Firms need a broker in order to assemble as a group.

Contact:

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Russell Mohnery, Director of Development & Marketing  
Pacific Wood Products Cooperative  
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## THE PHILADELPHIA COLLECTION

Objective: To create a marketing consortium for the promotion and sale of fine furnishing.

Types of Firms: Five designers/manufacturers of high-end custom commercial and residential furniture.

Membership Requirements: Agreement among the current members.

Governance Structure: Decisions are made by a committee comprised of all the members.

Activities: The group conducted a marketing survey to determine which kind of furniture and accessories are being purchased by architects and designers and at what prices. They have selected a range of existing products to be included in a joint catalogue and have agreed to design a number of new pieces to complete the Collection. They have analyzed costs of producing and distributing a catalogue and developed a business plan for implementing this effort. The network exhibited a portion of The Collection at the International Contemporary Furniture Fair in May 1992 in New York City.

Future Plans: To implement the business plan and establish national representation for The Collection; to provide woodworking apprenticeships to city youth; to exhibit at Milan's Salone del Mobile in 1993.

Funding: The sponsor has provided \$5,000 in cash and \$10,000 in in-kind support. Firms have provided over \$2,500 in cash and \$20,000 in time.

Sponsors: The Delaware Valley Industrial Resource Center (DVIRC), a local nonprofit economic development agency that provides technical assistance to small and medium sized manufacturing firms.

Broker: Manager of communications for the DVIRC.

Genesis: In March 1990, three firms approached the DVIRC for assistance in developing a joint marketing effort.

Challenges: Developing a formal structure for the group; setting priorities among numerous objectives; obtaining funding to implement the business plan for a catalogue and national representation.

Success Factors: Good pre-existing relationships. Common aesthetic sensibilities. Dedication to innovative furniture design.

Lessons Learned: A decision-making process should be formally established and set down in writing early in the development of the network. Issues and problems must be clearly resolved to the agreement and satisfaction of all members. Networks must be creative about the means required to accomplish their ends.

Contact:

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## THE PHILADELPHIA GUILD

Objective: To develop and market a new, proprietary line of furniture products for use at work in the home or office.

Types of Firms: Five woodworking firms: four production shops and one interior designer.

Membership Requirements: Agreement of the original members regarding the quality of a firm's operations and outputs, their attitude and customer service orientation and the complementarity in skill set, geographic coverage or market with other members.

Governance Structure: A joint-venture partnership. All members have an equal vote. Operating decisions are by consensus, constitutional issues such as admitting or asking members to leave are decided by unanimous votes minus one.

Activities: In spring 1991, the Guild hired a consultant to conduct an in-depth audit of its capabilities as well as its relative strengths and weaknesses in each area. The results demonstrated that each firm had a distinctly different mix of production skills, that at least one firm in the group possessed each of the skills that had been identified as being critical, and at least one member had a top rating in every category. As a whole the group possessed certain skills that were distinctive in their combination. This analysis was used by the consultant to identify market opportunities in the home office market where these skills could be profitably applied. During the winter of 1991-1992, Guild members designed and develop prototypes of a line of furniture and arranged to exhibit at a prominent local show house in May 1992. This event will be used as a "focus" group to test market and help refine the designs, pricing and market materials.

Future Plans: To initiate a regional marketing effort over the course of the year and develop a business plan for national marketing and distribution.

Funding: The sponsor provided approximately \$48,800 dollars to this network--\$36,000 in cash for expenses, a matching grant for the market research and the cost of the facilitator and the balance as in-kind contributions of time. Guild members have contributed close to \$30,000 in cash and an estimated \$20,000 as in-kind time.

Sponsor: The Delaware Valley Industrial Resource Center (DVIRC), a local non-profit economic development agency that provides technical assistance to small and medium sized manufacturing firms.

Broker: A consultant to the DVIRC with a background in strategic planning and group dynamics.



Genesis: The idea for a network originated in mid-1989 with a DVIRC client. A dozen firms with strong reputations for quality workmanship were contacted by the broker by telephone. Individual interviews were conducted to introduce the idea of a network, assess their interest, learn about their businesses and identify common needs. Interested firms were invited to an initial meeting in January 1991. A series of meetings resulted in a decision to conduct a capabilities assessment, a market analysis and to form a partnership for the purpose of developing a line of proprietary products and to obtain additional sales for the custom side of their businesses.

Challenges: Financial difficulties caused by the recession. Creating relationships of trust among individuals who did not know one another and were in some cases direct competitors. Establishing a common direction or purpose.

Success Factors: Patience. The motivation to engage in collaborative activities provided by poor economic conditions. The complementarity of skills and personalities within the group.

Lessons Learned: Participation in networks should be developed in stages. Each stage in the process should provide firms with either concrete benefits or clear evidence that such benefits can be achieved. Group meetings are the lifeblood of the network. Appropriate norms of behavior are important.

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## **TECHNOLOGY COAST MANUFACTURING AND ENGINEERING NETWORK (TECMEN)**

Objective: To compete more successfully on Department of Defense (DOD) contracts and to obtain commercial-sector business through joint marketing, joint production and group purchasing.

Types of Firms: Thirty DOD contractors in electronics, metalworking and electromechanical manufacturing. Firms range in size from 16 to 300 employees and from \$1.5 million to \$30 million in revenue. They are all located in two industrial parks.

Membership Requirements: Firms must have local manufacturing or engineering capacity, must conduct at least \$500,000 in business or employ more than five people in the county and be members of the local economic development council (\$1,000 annual fee).

Governance Structure: Advisory board consists of CEO's from 12 companies. Meets monthly to discuss ideas and to set policy. Formally governed under the auspices of the Economic Development Council of Okaloosa, which is nonprofit.

### Activities:

1. Local subcontracting: identified work that could be done locally but was being sent out-of-State. Network members are informed before subcontracts are let. Sixty subcontracts have been let among this group of firms over the last 18 months; none occurred previously:
2. A purchasing consortium for office supplies was initiated. Each year a different company coordinates it.
3. Joint marketing, based on a comprehensive capability inventory, produced their first contract in October 1991. Network is focusing on new markets, such as biomedical equipment and contracts from R&D center at nearby Edwards Air Force Base for which individual firms are too small. Joint marketing will be done by each firm's staff. Initially, three individuals will be chosen to "piggyback" the network's marketing onto their own efforts. The network will identify targeted opportunities on which these individuals will call. They will receive a monthly retainer and a negotiated percentage of the contracts they obtain. When more than one firm can complete a contract, the work will be awarded by random drawing; once a firm has received a contract on this basis, it will have to wait until others have participated.

Future Goals: Continuation/expansion of existing efforts, attaining self-sufficiency.

Funding: Initial grant of \$100,000 from Florida Department of Economic Development and from the Economic Development Council of Okaloosa for \$50,000. The first cost to members will be the retainer for the marketing staff. The network is expected to become self-sustaining in 3 years through a set-aside percentage on all future contracts.

Sponsors: The Economic Development Council (EDC) of Okaloosa County and the Okaloosa-Walton Community College.

Broker: College provost and EDC staffer. Had existing relationships with CEO's and knew firms' capabilities through his work implementing customized industrial training programs over 15 years.

Genesis: College hosted conference on networking in 1989. Interest was stimulated when DOD announced contract cuts later that year. Firms approached the college. Additional firms that met the membership requirements were asked to join. Industry needs were identified through one-on-one conversations and surveys.

Challenges: The firms had not dealt with one another before, considering themselves to be competitors. Funding. The recession.

Success Factors: The strong motivation of the participants, their industry similarities, the fact that the network is industry-led, the development of trust among the CEO's and the presence of a neutral third party to broker the effort.

Lesson Learned: Local, homegrown initiatives work best.

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## **WESTERN PENNSYLVANIA REGIONAL METALWORKING NETWORK**

Objective: Establishment of a regional metalworking network focused on employee training and joint marketing.

Types of Firms: Over 60 foundries, precision machine shops, tool and die shops, pattern makers, design and engineering firms in southwestern Pennsylvania have expressed an interest in participating. Sixteen firms are actively involved.

Membership Requirements: Undetermined.

Governance Structure: A leadership council of 16 firms both geographically and functionally representative of companies that have committed to quality, productivity and advanced technology. The council also includes several project sponsors: Technology Development Educational Corporation/Southwest Pennsylvania Industrial Resource Center, Pittsburgh chapter of National Tooling and Machining Association, Ben Franklin Technology Center of Southwestern Pennsylvania, Alle-kiski Revitalization Corporation. A steering committee of four firms has been established to guide work of project team (which consists of the nonindustry members).

Activities: A strategic audit of 45 foundry companies was conducted in 1989/90 (see Genesis). Found more vitality and less competition among firms than expected. Networking and exporting was occurring. Identified a critical mass of 20-25 innovative firms who were willing to work together. They wanted help accessing capital, upgrading employee skills, improving quality and working through government waste-management regulations. During second year, broker devised work plan for implementation, assembled technical and financial resources; work plan formally initiated in December 1991.

Training--Developing work-based learning program for existing employees. Conducting interviews to assess training needs, designing several training modules. Will identify participating firms and initiate pilot programs by August 1992. Program is driven by need to serve customers in a global market, comply with ISO 9000 quality procedures, enhance worker productivity and improve product quality to world-class standards.

Marketing--Developing a capability directory to be used internally among network firms in order to identify subcontractors, joint bid partners and referral possibilities as well as externally to demonstrate network's ability to meet customer needs. Format is being established and network has hired a local marketing firm with industry experience to collect the data. Eventual goal is to develop an on-line interactive format which can be updated easily and on which information can be exchanged by members and potential customers.

Future Plans: To identify strengths and weaknesses within the network, convene focus groups with key industry buyers, determine target markets and how to fill the gaps; to develop a regional and national sales/marketing strategy in which firms go beyond selling capacity to developing new products and engage in engineering, design and distribution; to demonstrate the value of the network to firms and obtain financial commitments to become self-sufficient; to have the network administration provided by an industry-established entity.

Funding: Received an \$80,000 grant from Pennsylvania Department of Commerce's Manufacturing Innovation Network Program to conduct a strategic audit. No funding for second year, support provided by the Pennsylvania Foundrymen's Association and broker on a pro-bono basis. In 1991-1992: Ben Franklin Technology Center of Southwest Pennsylvania provided \$40,000 for training program; the local chapter of the National Tooling and Machining Association, \$10,000; the Pennsylvania Foundrymen's Association--\$61,000, \$30,000 in cash; Southwest Pennsylvania Industrial Resource Center \$100,000--\$70,000 in cash; the Alle-kiski Revitalization Corporation \$53,000--\$11,5000 in cash; \$264,000 in total this year.

Sponsors: Pennsylvania Department of Commerce, Pennsylvania Foundrymen's Association, Pittsburgh Chapter of National Tooling and Machining Association, Technology Development Educational Corporation/Southwest Pennsylvania Industrial Resource Center, Ben Franklin Technology Center of Southwestern Pennsylvania, Alle-kiski Revitalization Corporation.

Broker: A consultant specializing in local economic development.

Genesis: In 1989, Pennsylvania Foundrymen's Association and broker responded to a grant opportunity from the State. Project began as an effort to improve the competitiveness of local foundry firms, which the association thought were dying from decline of Pittsburgh steel industry and strain from environmental issues. Network was later expanded to include a broader range of firms.

Challenges: Issues of control arising from multiple public sector agencies and funding sources with different agendas.

Success Factors: The foundry association and its pre-existing relationships with firms, the State's willingness to be a partner, the firms' willingness and readiness to work together.

Lessons Learned: A network takes a long time to create. Firms are easier to work with than public-sector agencies. It is better for the network to be self-sufficient than to deal with bureaucracy.

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Plymouth Meeting, PA 19462  
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## **WOOD PRODUCTS MANUFACTURING NETWORK, INC.**

Objective: To encourage the adoption of new technology, promote joint production and marketing as well as new product development.

Types of Firms: Forty secondary wood product manufacturers and two associate members from multicounty area in north central Minnesota. Shops range in size from three to 200 employees and operate in three industry segments: giftware (craft items), furniture and cabinets, and building materials. Includes some saw mills with kilns.

Membership Requirements: Must be a secondary wood manufacturer in Northern Minnesota. Dues: \$25 for firms with nine or fewer employees; \$50 for firms with 10 or more.

Governance Structure: Nonprofit corporation. Board of directors meets monthly, general membership every 3 months. Director's time is contracted for from the sponsoring organization.

### Activities:

1. Quarterly seminars (followed by membership meetings) to encourage adoption of advanced production techniques.
2. Technical assistance on production, cost accounting and marketing.
3. Seed funding and assistance in developing joint ventures: (a. Three cabinet firms' are trying to create a new product. Network will fund initial marketing study to analyze the competition, demand level, market segments. A request for proposal will be issued and the firms will choose a consultant to conduct the research. (b. Shared equipment facility among four firms was established (all but distributor located within 10 miles of each other) in summer 1991 as result of network activity.

Future Plans: To establish four network projects in second year.

Funding: A grant from the Northwest Area Foundation for 3 years at \$100,000 per year. Minnesota Technology, Inc., sponsors a Wood Products Technology Program at \$100,000 a year for 3 years. This money is being used to meet the training needs of network firms. The Northwest Minnesota Initiative Fund sponsors a business assistance program that will fund 50 percent of a project's cost for wood product firms. In the future, it is expected firms will return the amount of the funds provided by the network to sponsor joint venture projects, plus some additional amount. This arrangement will enable the network to become self-sufficient eventually.

Sponsor: Headwaters Regional Development Commission.

Broker: A manufacturing engineer with existing industry relationships.



Genesis: Forest products, one of the largest industries in the State, was targeted for project. Network initiated in January 1991. First 6 months were spent recruiting firms, establishing credibility. First network meeting held on March 10, 1991. Needs were assessed by survey. Four areas were identified: (1. marketing, (2. wood waste, (3. raw materials supply, (4. product development.

Challenges: Identifying and recruiting firms when many aren't listed anywhere. Nurturing the network. Funding.

Success Factors: Manufacturing background of broker, ability to be comfortable with different types of manufacturers, existence of a core of people with whom to work.

Lessons Learned: Time, patience and incremental steps are necessary to build trust and credibility. Hierarchy must tolerate this building process. This phase is difficult--whatever time frame you have, double it. Give firms features and benefits of networking, not the details. To make it industry-driven, broker must move discussions along to the point where ideas become owned by the firms. Broker must be comfortable with little victories. Will only be working with 3 to 4 percent of the firms that have vision and wherewithal. It is not for the network to market what firms make, but for firms to make what the market wants. Informal side of networking happens naturally.

Contact:

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Headwaters Regional Development Commission  
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## WOODNET

Objective: To promote new product development, joint marketing, joint production and shared resources.

Types of Firms: Seventy-five wood products manufacturers from a multicounty area on the Olympic Peninsula, producing arts and crafts, construction and mill products. Range in size from one-person shops to 80 employees.

Membership Requirement: Woodworking firms.

Governance Structure: A nonprofit corporation with board of directors that meets annually. Broker sets strategy with board approval.

### Activities:

1. During 1991, broker established name recognition for the network and educated firms about manufacturing networks.
2. Broker formed eight network groups in different regions of the peninsula, organized on both a functional as well as geographic basis. The broker's role is to identify key participants, host the first few meetings and provide ongoing support (by attending as many meetings as is possible). Each meeting is facilitated and begins with a discussion of networking. The groups meet at least monthly, some have been meeting for 6 to 8 months. Two are just past this initial stage. One is putting together a catalogue of products; one is exploring the establishment of a cooperative shop; another is considering a route to pick up and distribute products; one firm is trying to create a privately owned industrial center operated by several businesses.
3. Following the completion of this initial stage of development, the network plans to offer design, marketing, business planning and production services to firms.

Future Plans: To establish additional network groups, to create product catalogues, to identify distributors for firms' products and to become self-sufficient.

Funding: Supported by a 3-year, \$294,000 grant from Northwest Area Foundation, \$5,000 from Clallam County Economic Development Council and \$15,000 from Washington Department of Community Development. Services are provided currently to firms and networks for free; at some point, a fee structure will be established.

Sponsors: Self-sponsored.

Broker: Attorney by vocation, worked in electronics manufacturing and marketing, no background in wood industry. Responded to a classified advertisement for a broker in the Wall Street Journal.

Genesis: Project was motivated by cutbacks in U.S. Forest Service timber harvests and land use issues (e.g., spotted owl). Peninsula largely consists of primary manufacturers. Several individuals identified grant opportunity, met and wrote funding proposal in late 1990. Broker was hired in April 1991.

Challenges: Changing the mindset of mill owners who are reticent to join after generations of cutthroat competition and secrecy. Distance among firms (a round trip on peninsula takes 4 hours). Lack of physical infrastructure for secondary manufacturing (e.g., utilities). Lack of education. Concern about antitrust. Becoming self-sufficient.

Success Factors: The fact that the organization is privately rather than publicly funded. Firms are more willing to take risks because of economic pressures. Networks are one possible solution.

Lessons Learned: Success cannot be easily measured--the deals and collaboration that are occurring are not always known to the broker. Taking a piece of the action taints the process. Certain organizations provide services (such as education, development or opportunities for growth) that are important enough to be supported. Easier to teach networking by walking firms through the process and have them experience it themselves than to explain it.

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## IV. APPENDIXES

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### APPENDIX A:

#### ADDITIONAL NETWORK PROJECTS AND NETWORK CONTACTS BY STATE

This appendix lists by State additional network projects that are in the formative stages of development as well as individuals or organizations actively involved in networking in that State.

##### ALABAMA

###### Apparel Industry Network

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Planning and Economic Development Division  
Alabama Dept of Economic and Community Affairs  
P.O. Box 5690  
Montgomery, AL 36103-5690  
P: (205) 242-5472; F: (205) 242-5515

Objectives of this network are to maximize trade between firms and to reduce costs.

###### Tooling and Machining Company Network

Gregg Bennett, Executive Director  
The Bevill Center  
Advanced Manufacturing Technology  
Gadsden State Community College  
P.O. Box 2488  
Gadsden, AL 35903  
P: (205) 547-5782; F: (205) 547-5790

An informal network of 15 metalworking firms, this group has initiated several programs with the support of the Bevill Center. It has created a U.S. Department of Labor Certified Apprenticeship Program, allowing students to rotate through their shops to obtain practical skills while attending the local community college. Apprentices will receive labor certification, National Tooling and Machining Association certification and an associate's degree. Firms supervise the program as well as pay for employees' wages and college tuition. The network has also jointly purchased a Statistical Quality Control interactive video training program, which will rotate from firm to firm. Firms participate in demonstrations of new technology. A program to attract and train minority women for jobs in the industry is being developed. Joint marketing activities are being considered. Discussions are taking place regarding the formation of a full-fledged industrial network, and a search is underway for an experienced network broker.

## ARKANSAS

### Arkansas Science and Technology Authority

Jim Benham, Vice President-Finance

100 Main Street, Suite 450

Little Rock, AR 72201

P: (501) 324-9006; F: (501) 324-9012

The Authority manages the Arkansas Industrial Networking Project. It has conducted three 2-day broker training seminars and sponsored a \$95,000 Challenge Grant program. The following four projects have received grants:

### Southern Arkansas Wood Products Association

Brian Kelley

Arkansas Enterprise Group

605 Main Street, Suite 203

Arkadelphia, AR 71923

P: (501) 246-9739

A network of 10 to 20 primary and secondary wood products manufacturers is being developed.

### Fort Smith Manufacturing Network Project

Broker: Westark Community College

A proposed network of furniture manufacturers.

### CAD System

Arkansas State University, Beebe

Metalworking firms have formed a group to jointly utilize a CAD system owned by the university. Collectively, the firms will be responsible for installation, maintenance and scheduling.

### Delta Safety Network

Phillips County Community College

Eight chemical companies will provide safety training to industry employees.

## FLORIDA

### TEC-NET/Silicon Coast Corridor, Inc.

Phil Halstead, Chairman & CEO

2004 Lewis Turner Blvd., Suite C

P.O. Box 669

Fort Walton Beach, FL 32549-0669

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Tech-Net is a 1-year-old public/private partnership among 100 firms located along the northern corridor of Florida's Route 10 from Pensacola to Jacksonville. Modeled after the Japanese technopolis, Tech-Net's strategy is to link existing high-technology businesses with each other as well as to institutions such as Florida State University's National High Magnetic Field Laboratory and Supercomputer Computations Institute and the joint Florida A & M University/Florida State University College of Engineering. The network is in the early stages of development. Fifty to 70 representatives have been meeting each month in different locations in Northwest Florida.

## ILLINOIS

### Illinois Department of Commerce and Community Affairs

Gerri Green

State of Illinois Center

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Chicago, IL 60601

P: (312) 814-2329; F: (312) 814-6732

Responsible for manufacturing networks program in the State, this agency has initiated a program to promote export networks. The Illinois Export Manufacturing Network Project provides broker training, member company orientation seminars on exporting, member company training workshops on exporting, and technical assistance. The lead organization for this project is:

### Export Resource Associates Inc.

203 N. LaSalle Street, Suite 2100

Chicago, IL 60601

P: (312) 558-1367, F: (312) 558-1361

### Joyce Foundation

Joel Getzendanner, Program Officer

135 S. La Salle, Suite 4010

Chicago, IL 60603

P: (312) 782-2464

This foundation has funded a number of manufacturing network projects in the Midwest.



Export Expansion Pilot Project

Jim Holmes, Export Project Manager  
North Business and Industrial Council (NORBIC)  
2500 West Bradley Place  
Chicago, IL 60618  
P: (312) 588-5855; F: (312) 588-0734

The objective of this project is to introduce Chicago firms to exporting and to expand the international markets of existing export companies through collaborative means. The project will work with 20 to 30 firms with sales under \$12 million that are currently exporting. These firms will be selected on the basis of their export potential. They will be provided with the services of an international trade consultant at highly subsidized rates who will conduct a detailed market study evaluating specific markets, examining legal and financial considerations and making specific recommendations. In phase two of the project, these firms will be required to participate in an export council, which will serve as a resource for firms seeking to develop international markets for the first time. This network is funded by the Joyce Foundation, the Chicago Community Trust Foundation and company contributions.

South Chicago Job Authority

Tom DuBois, Executive Director  
9350 S. Chicago Avenue  
Chicago, IL 60617  
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This organization is creating two networks of firms to engage in joint training activities. The first, called the Southeast Chicago Industry Training Consortium, consists of five geographically clustered companies in two different industries (four steel manufacturers and one food company) that have developed a program for maintenance workers. They began meeting in the spring of 1991, and have put in a proposal to the State for funding of a program to begin in spring 1992. The second consists of a group of seven fabricated structural steel producers who have identified a need for training steel detailers. They are also seeking preferential treatment from the city of Chicago on contract bids. The organization has received funding from the Joyce Foundation.

**Several other organizations in Illinois are reported to be exploring the possibility of developing networks:**

Tooling and Machining Association

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Park Ridge, IL 60068-9009  
P: (708) 825-1120

Apparel Industry Board Institute

Lauri Alpern, Chair  
Business Retention Committee  
University of Illinois at Chicago  
815 West Van Buren # 500  
Chicago, IL 60607  
P: (312) 996-9132

Richland County Manufacturers

Stand Wieber, Director  
Richland County Development Corporation  
1001 East Main Street  
Olney, IL 62450  
P: (618) 392-2305

Rockford Area Networks

Bill Milligan  
Rock Valley College Technology Center  
3301 North Mulford Road  
Rockford, IL 61111  
P: (815) 654-4257

Working with metalworking firms.

**INDIANA**

Calumet Project for Industrial Jobs

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East Chicago, IN 46312  
P: (219) 398-6393; F: (219) 397-3482

The objective of this network initiative is to identify common needs of local firms through a network of union workers who monitor 40 companies for early warnings of plant closings. Begun in August 1991, this project faces two challenges: obtaining labor's participation in attempting to improve firm operations and overcoming the resistance of companies to ideas for change which come from workers. These challenges will be addressed in the course of implementing this project. The organization, funded by the Joyce Foundation, will first target receptive unions and companies and focus on projects that will improve productivity and thereby demonstrate the value of this approach to other firms. These companies will be identified through a needs assessment by workers in the early warning network of their plants and conversations with area union leadership (steelworkers, clothing/textile workers, oil/chemical/atomic workers, machinists, autoworkers).

Columbus Enterprise Development Corporation

David Yount, President  
4920 North Warren  
Columbus, IN 47203  
P: (812) 379-4041

The corporation is a nonprofit organization whose purpose is to assist small manufacturers in a five-county area in south central Indiana. It also operates a small business incubator. The corporation helped to develop a network of six metalworking firms. This group has initiated a joint quality improvement program and has received a \$56,0000 grant from the State's Department of Commerce for one-third of the cost. The firms split the other two-thirds under a complicated formula which includes the number of employees to be trained and the level of sophistication of the firms. This 24-month project is scheduled to be completed in April 1992.

**KANSAS**

WI/SE Partnership for Growth

350 W. Douglas  
Wichita, KS 67202  
Tim Witsman P: (316) 265-2095  
Jim Schwartzenberger P: (316) 265-2095  
Bill Pritchard P: (316) 529-2222

Wichita City Government/Sedgwick County Government Partnership for Growth was established by city and county government with funding from large aircraft manufacturers. The objective is to work with small suppliers of area airline manufacturers. A purchaser/supplier survey has been conducted, and suppliers have been linked up electronically to prime contractors. A machinist apprenticeship program, partially funded by large corporations, has been developed, Wichita State University is providing extension services to firms.

Source: U.S. Department of Commerce Clearinghouse for State and Local Initiatives in Productivity, Technology and Innovation.

**LOUISIANA**

Louisiana Department of Economic Development

Dave Roach, State Economic Advisor  
P.O. Box 94185  
Baton Rouge, LA 70804-4185  
P: (504) 342-5361  
F: (504) 342-5389

State's contact on manufacturing networks.



## MAINE

### Center for Technology Transfer

Robert Dalton, Executive Director  
University of Southern Maine  
59 Exeter Street  
Portland, ME 04103  
P: (207) 780-4616; F: (207) 780-4947

Seven network projects, with the exception of the CAD Service Center, were initiated under a challenge grant program. The program guidelines required that applicants consist of a self-assembled network of firms, that they focus on the development of a commercializable product whose elements were already in place, that they submit a timetable for project completion and criteria for measuring the success of their effort, and that, if successful, their payback to the State would be at 1.5 times the cost of the grant.

CADD Service Center--Established in 1990 and housed at the Maine Research and Productivity Center, the center was a need identified by members of the Aristook Manufacturers Association. Its purpose is to demonstrate and provide training in technologies which are unaffordable to many small firms. Ten companies have used the center. As a result, one purchased its own CAD system. However, due to funding cuts, the center is not currently operating. New funding and a new location are being sought.

### Hopper Sander

Ken McCue, President  
Bryant Steel Works  
RFD 2, Box 1470  
Thorndike, ME 04986  
P: (207) 568-3663

A group of six firms, led by Bryant Steel Works, received a \$17,500 grant from the Center for Technology Transfer, to complete the design and development of a hopper sander. A majority of the sales will be to local governments.

### Sludge DeWatering Technology (DWT)

Contact: Robert Dalton, CTT

Three companies received a \$25,000 grant to develop a patented, proprietary technology for taking municipal sludge and drying it to commercially acceptable standards into a product. The system will sell for \$350,000 and has the potential to be downsized for use in machine shops.

### Dry Rock Removal System

Contact: Lloyd Duncan

Northern Maine Technical College

Presque Isle, ME

P: (207) 769-2461

Four firms working with the Northern Maine Technical College have received a grant for \$15,000 from CTT in order to develop a system to remove rocks from potatoes. The grant will enable the network to develop proof of concept; final commercialization will occur after the project. Rocks are needed in the field because of their nutrient value. However, current methods of removing rocks are either environmentally bad and mildew potatoes or cost over \$100,000 and are not affordable by the average grower. By adopting sensing technology developed in the early 1960's, this product will be capable of handling 350 barrels of potatoes per hour, will be able to be used in the field, will work with conveyors and will cost in the range of \$20,000 to \$25,000.

### Joint Purchasing Network

Contact: Robert Dalton, CTT

A pilot project among 10 metalworking companies with different operations to jointly purchase materials was developed in September 1991. Interested firms were identified by mail and needs were similarly assessed. The initial study indicated potential savings of as much as 10 percent to 35 percent. However, after a 5-month pilot which focused on office supplies purchased by a third party firm, the program was stopped because of conflicts with purchasing managers. The project will be refocused on other types of supplies. For example, four firms are jointly buying grinding wheels and working collectively to get rid of metal shavings. Two companies have already identified a need for a professional packaging engineer, which they each subsequently hired 1 day a week. Monthly meetings among the firms are being initiated.

### Liquid Level Underground Sensor System

Contact: Robert Dalton, CTT

Four companies are collaborating on a \$17,500 grant to design and develop a housing for a new technology sensor to be used in underground storage tanks. Existing housings are metal; the firms believe that plastic housings would be more competitive.

### Electronic Job Controller for Disabled/Handicapped

Contact: Robert Dalton, CTT

Three firms are working with the Production Technology Center at University of Southern Maine to design and build an inexpensive, multipurpose electronic controller based upon a personal computer. This product will aid in the performance of two different job tasks for disabled or handicapped workers.

It may also have wider applications in industrial settings where caution is required and workers need to be reminded about tasks. The network was awarded \$10,000.

Hazardous Waste Reduction

Contact: Stan Eller

Natural Resource Council of Maine

P: (207) 622-3101

The Natural Resource Council of Maine and the Maine Metal Products Association, representing over 100 firms, have joined together to develop a self-assessment manual to help companies eliminate toxic use and hazardous waste generation. The \$12,500 grant in May 1991 was the catalyst for these traditionally natural enemies to collaborate on an activity that would protect the environment as well as produce beneficial outcomes for firms. The manual will be based on actual audits of six to nine successful companies. The next objective is to use this manual to develop technical assistance programs for firms in toxic use reduction.

**MARYLAND**

Office of Technology Development

Robert A. Sklar, Deputy Director

Maryland Department of Employment and Economic Development

217 East Redwood Street

Baltimore, MD 21202

P: (301) 333-6990; F: (301) 333-4460

Contact for State's networking efforts. Just getting underway.

**MASSACHUSETTS**

TECnet

Leslie Schneider

Manufacturing Resource Center

Tufts University

Anderson Hall, Room 203

Medford, MA 02155

P: (617) 381-3818; F: (617) 623-1427

Center supports networks and individual manufacturers. Satellite of Northeast Manufacturing Technology Center at Rensselaer Polytechnical Institute in New York.



Bay State Center for Applied Technology

John S. Hoops, Director  
Bay State Skills Corporation  
101 Summer Street, 2nd Floor  
Boston, MA 02110  
P: (617) 292-5100; F: (617) 292-5105

This organization, supported by the State, develops and funds manufacturing networks in Massachusetts.

Machine Action Project (MAP)

Robert Forrant  
1176 Main Street  
Springfield, MA 01103  
P: (413) 781-6900; F: (413) 736-0650

MAP's objective is to help strengthen the area's metalworking industry. Initiated in 1986, MAP has been funded in part by the State's Industrial Services Program, and has focused its effort largely on training. It has worked with training providers to establish skills upgrading programs, apprenticeship programs, bring woman and minorities into the trades and to develop quality management workshops. MAP has created a computer network system and has completed a capability assessment of 75 firms in Hampden County for the purpose of starting a manufacturing network. Defense Department cutbacks have raised serious issues of survival and conversion for area firms; at the same time, the State is reducing its level of funding support.

New England Technical Services Network (NETS)

Contact: Leslie Schneider  
Manufacturing Resource Center  
Tufts University College of Engineering  
Anderson Hall, Room 203  
Medford, MA 02155  
P: (617) 381-3818; F: (617) 623-1427

NETS is a group of 11 metalworking and related firms located on the North Shore in Massachusetts. It was initiated in spring 1991 by a company that approached TECnet for support in starting a network. This lead firm found 10 others with complementary capabilities and reputations for reliability to participate. The network's objective is to expand each firm's business through joint marketing and production. A capability directory has been created, and the next activity will be to perform an in-depth independent evaluation of each firm's capability and quality levels. The network is developing a strategy for entering new markets (e.g., medical and environmental manufacturing) and engaging in joint bidding and cross referrals to each other in order to obtain larger jobs. At this stage, an independent entity will not be established; one company will have a dedicated phone line for the network. Any company that obtains a project will be the lead. The network is facilitated and supported by TECnet and meets once a month for breakfast.

### Boston Edison

Don Walsh, Manager for Economic Development  
Boston, MA 02199  
P: (617) 424-2969  
also: Leslie Schneider, Tufts

This electric utility is trying to organize networks of community organizations and businesses so that it can support its customer base in the region. This project will seek to encourage local customers to buy from each other. The network will be supported by an electronic infrastructure. If the model works, it will be replicated in other communities.

### Digital Equipment Corporation (DEC)

Contact: Leslie Schneider  
Manufacturing Resource Center  
Tufts University College of Engineering  
Anderson Hall, Room 203  
Medford, MA 02155  
P: (617) 381-3818; F: (617) 623-1427

DEC is attempting to develop a local supplier network to provide customers with the various repair and support services they need when they purchase a computer system, something currently done on an individual, ad-hoc basis within the company. A pilot project will be conducted from January to June 1992. If it works, it will be replicated in other locations.

### Metal Stampers Network

Contact: John Hoops  
Bay State Center for Applied Technology/BSSC  
101 Summer Street  
Boston, MA 02110  
P: (617) 292-5100; F: (617) 292-5105

A group of 15 metal stamping firms, including an industry supplier of sensors and testing equipment, has been meeting monthly since the middle of 1991, in order to discuss various topics of mutual interest. Five of the firms are involved in a technology transfer project relating to lubricants. The Metal Forming Lubricants Development Group is a set of six metal forming firms have formed a technology transfer network to develop lubricants that perform to requirements and that are environmentally compliant. The group is developing ties to Federal labs and may develop a cooperative research and development agreement in a consortia-type format.

### Center for Quality Management

Dr. Thomas Lee, Director  
Bolt, Beranek and Newman  
70 Fawcett Street 15/4B  
Cambridge, MA 02138  
P: (617) 875-2154

The mission of the Center for Quality Management is to accelerate understanding and implementation of quality management concepts and methods by creating a network of like-minded organizations to share knowledge and experiences. This will require a common language and a shared understanding of basic methodologies to define problems and to design solutions. In the broadest terms, the long-term objective of the center is to promote organizational and societal learning about how to improve the performance of human systems.

Consisting of 22 technology/manufacturing firms (such as GE Aircraft, Analogue Devices, etc.) and five university affiliates, the center has been in existence for a number of years. The center and its programs are supported by annual membership fees of \$10,000. Training and research is done with volunteer labor from each company. The center offers a 6-day course for executives and company visitations.

## **MICHIGAN**

### Industry Alliances Program

Contact: Christine Rector, Director  
Northern Economic Initiatives Corporation (NEICorp)  
1009 W. Ridge Street  
Marquette, MI 49855  
P: (906) 228-5571; F: (906) 228-5572

NEICorp has initiated a series of networks in various industries since beginning the Industry Alliance program in spring 1990. Most of the networks are in the formative stage of development.

#### A. Woodworking Networks

1. A group of five wood manufacturers with between five and 20 employees have implemented a modernization strategy designed to strengthen their competitive advantage and position them as potential tier-one component suppliers. The group participated in computer training for CAD, management information systems and financial management. It has recently added a sixth member and is preparing to jointly manufacture a line of gameroom furniture for national distribution.

2. NEIC has been working with five large furniture manufacturers with 100 to 300 employees, since mid-1990, to foster networking relationships and encourage the development of component supplier relationships with the small wood manufacturers.



This group meets on a quarterly basis and has engaged in a series of exchanges including plant tours, education seminars, and technology information sharing sessions. A joint funding proposal has been developed to formalize the network. It outlines a 5-year strategy for funding and programming, including a fee for membership structure.

3. NEIC has established an alliance with the Michigan Association of Timbermen by offering strategic planning, export counseling and assistance. This alliance will help NEICorp deliver market-driven programs to association members.

The 500-member association has been encouraged to view its group as a network. In September 1991, a conference was held with association members, its board, legislative representatives and State administrators to discuss the value of networking and international trade opportunities.

#### B. Professional Craftsmen Group

NEICorp has begun to work with almost 40 professional craft producers to help them think about collaborative activities. They have conducted a number of focus groups on marketing issues and opportunities and are coordinating joint displays at regional and national trade shows. Participation in marketplace events is jointly funded by exhibiting artisans.

#### C. Food Processors

Maple Syrup Cooperative: A group of 40 companies started meeting in 1989/90 to develop greater industry clout. They have developed/published grading standards for wholesale syrup and are currently developing a business plan and marketing strategy. The co-op is currently reviewing two potential sources of distribution for their collective product: a national food marketing cooperative and a national specialty foods manufacturer and retailer.

#### D. Externally Initiated Networks

Regional Manufacturing Network: A group of five firms in different industries formed a network and have approached NEIC to facilitate.

#### Warren Conner Development Coalition

Seth Borgos, Associate Director

5555 Conner

Detroit, MI 48213

P: (313) 571-2800 or (313) 894-1066; F: (313) 571-7307

Inner-city community development corporation looking to develop a training program among 20 to 30 industrial service firms in the area for entry level employees. A cooperative job service is being implemented in February 1992. Firms are interested in more communications among each other and in developing better supplier

relationships with the auto industry. However, no further agenda has yet been developed. This effort is being funded by the Joyce Foundation and the Hudson-Webber Foundation.

Labor/Management Council for Economic Renewal

Maureen Sheahan

9650 S. Telegraph

Taylor, MI 48180

P: (313) 291-1474; F: (313) 291-2269

The network, initiated in June 1990, consists of 21 firms and eight local unions. The group is working in four areas: (1. participative strategies, (2. Human resource development, (3. health and safety, (4. Employee assistance and wellness. Since that time, brokering organization has held a number of labor/management training programs. In September 1991, the network entered into a contract with Industrial Technology Institute to collect data about the capabilities and needs of participating firms. A 40- to 50-page survey was designed and an on-site interview is being conducted by an industrial engineer. Ten members will participate in study. A joint purchasing program of workers' gloves was initiated in February 1992 among 12 firms. The network has received a 6-month grant for \$24,000 from the Michigan Department of Commerce for the facilitation of the network as well as funds from the Joyce Foundation. Dues range from \$500 to \$1,000 depending on size.

In 1990, the Michigan Modernization Service (MMS), a Statewide agency whose purpose was to help modernize and improve the productivity of small and medium-sized manufacturing firms, issued 17 Group Service Grants in order to encourage the efficient provision of assistance to groups of firms. Since the abolition of MMS in 1991, these projects were not officially continued, except in those case where additional participation and funded was obtained. A mid-term assessment of those project was done by Linda Ewing at the Industrial Technology Institute (ITI) in Ann Arbor, Mich. The report is "Fostering Cooperation in Michigan's Industrial Base: A Final Report on the Group Service Grant Program," July 31, 1991, and is available from ITI. See Appendix B to order.

## **MINNESOTA**

Northwest Area Foundation

Terry Saario, President

332 Minnesota Street, Suite E-1201

St. Paul, MN 55101-1373

P: (612) 224-9635; F: (612) 225-3881

The foundation has funded six network initiatives in the Northwest United States.

## **MONTANA**

### Montana Indian Manufacturers Network

Leonard Smith, Coordinator

Montana United Indian Association

P.O. Box 6043

Helena, MT 59604

P: (406) 443-5350; F: (406) 443-5351

This network of seven tribal- or Indian-owned enterprises located throughout the State is seeking to improve production capability, increase access to new technology and develop new commercial markets. These firms are defense contractors with operations ranging from metal fabrication, welding, injection molding, machining, electromechanical, electronics assembly and manufacturing to industrial sewing. They are developing a brochure, assessing their training needs with a college and are looking to form joint production and purchasing ventures. The network is funded through a grant from the Northwest Area Foundation.

### Montana Competitiveness Initiative

Contact: Christine Mangiantini

1309 Choteau

Helena, MT 59601

P: (406) 443-0030

The Montana Community Foundation received a planning grant from the Northwest Area Foundation to develop a program to launch manufacturing networks in the State.

## **NEW YORK**

### East Brooklyn Metalworking Network Project

Elise Fischer, Project Director

Local Development Corporation of East New York

116 Williams Avenue

Brooklyn, NY 11207

P: (718) 385-6700; F: (718) 385-7505

This organization has been working individually with a number of area metalworking firms. Several years ago, a survey of 67 local firms was conducted in order to determine their needs. Group activities are being planned.

### Bureau of Business Research

Robert W. Meyer, Program Research Specialist

New York State Department of Economic Development

One Commerce Plaza

Albany, NY 12245

P: (518) 474-5684



The following programs received grants in 1991 from New York's Supplier Network Project, Industrial Effectiveness Program. Additional grants have been awarded in 1992. Contact Robert Meyer for further information.

Business and Industry Center

Michael H. Heiberger, O.D., M.A.  
State University of New York College of Optometry  
100 East 24th Street  
New York, NY 10010  
P: (212) 420-5097

To retain and create new jobs in ophthalmic industry through a shared marketing program.

The Timber Resources Group

John Galda  
Jamestown Community College  
525 Falconer Street  
Jamestown, NY 14701  
P: (716) 665-5220

To create a supplier network for joint marketing purposes.

Rochester Chapter, National Tooling and Machining Association

James E. Hatch, Executive Secretary/Managing Director  
15 Boys Club Place  
Rochester, NY 14608  
P: (716) 546-8650

To develop ways to keep suppliers abreast of safety and waste-handling issues.

Chief Executives Network for Manufacturing, Capital Region

Raymond Piascik, Executive Director  
Capital Region Technology Development Council  
P.O. Box 1907  
Albany, NY 12201  
P: (518) 445-2230

To organize an internal vendor program, establish a group purchasing plan and develop a shared employee program.

Northeast Manufacturing Technology Center  
Gene R. Simons, Ph.D., Director  
Rensselaer Polytechnic Institute, CII 9009  
Troy, NY 12180-3590  
P: (518) 276-6682

To establish a western New York quality network.

Business and Industry Center  
Michael Sattler, Director  
State University of New York, Morrisville  
Morrisville, NY 13408

To develop strategies to satisfy local demand for labor.

## **NORTH CAROLINA**

Southern Technology Council  
Ray Daffner  
Network Project Coordinator  
Box 12293  
Research Triangle Park, NC 27709  
P: (919) 941-5145; F: (919) 941-5594

The Southern Technology Council (STC) established a Challenge Grant Program to encourage the formation of networks in North Carolina. In December 1990, STC funded eight demonstration network projects with support from the North Carolina Rural Economic Development Center and the Appalachian Regional Commission. These projects are listed below.

Catawba Valley Hosiery Association  
Paul Fogleman, President  
P.O. Drawer 1708  
Hickory, NC 28603  
P: (704) 322-2727

Received \$10,000 to develop a low-cost, computer-based production monitoring system which would allow member firms to better meet the requirement for quick-response. The product was developed by a company called Digital Eyes using a network of supplier organizations in conjunction with the Association. The Association invested \$10,000 in cash into the project. The system is now being installed in member firms, with a portion of the revenue from sales going to support additional Association projects.

#### North Carolina Sewn Products Network

Contact: Bill Meade, Consultant  
The Herndom Group, Inc.  
209 N. Columbia Street  
Chapel Hill, NC 27514-3503  
P: (919) 933-0640; F: (919) 933-0800

A network of apparel contractors and manufacturers received \$6,000. The firms have published a capabilities directory, listing 150 firms, which was distributed at the industry's largest trade show in September 1991. The network hosted an export session in late January 1992 at the Charlotte Apparel Center in order to hear from successful export manufacturers and to discuss specific opportunities with brokers by presenting product samples and discussing them with export agents. The network has since decided to collaborate on two new product lines for export--in children's wear and in active wear. The group is planning to identify suitable manufacturers for each product area, to customize existing products for export and to jointly develop marketing materials. The network has also received a grant from the National Association of State Development Agencies to assist them in their export activities.

#### Composites Industry Network

Contact: Phyllis Makuck, Director  
Center for Applied Technology  
East Carolina University  
Willis Building  
Greenville, NC 27858  
P: (919) 757-6708; F: (919) 757-6709

Eleven companies are participating in a network which focuses on environmental regulation compliance, marketing and the use of advanced material technology in new products that is both cost competitive and environmentally sound. Received \$10,000.

#### Value Systems

Bill and Cordes Seabrook  
P.O. Box 762  
903 North Manetta Street  
Gastonia, NC 28053  
P: (703) 865-8460

Metalworking firms in Gaston County are exploring networking opportunities. Received \$6,000.



Industrial Extension Service  
Bob Edwards  
School of Engineering  
North Carolina State University  
215 Page Hall, P.O. Box 7902  
Raleigh, NC 27695-7902  
P: (919) 737-2358

The Industrial Extension Service has developed two buyer/venture partnering networks consisting of a large firm and several small or medium-sized suppliers. One objective is to encourage firms to become qualified just-in-time suppliers to the large firm. Received \$10,000.

North Carolina Precision Metal Fabricators Association  
Randall Williams, President  
Advanced Fabrication Technology, Inc.  
P.O. Box 1627  
Oxford, NC 27565  
P: (919) 693-1354; F: (919) 693-2350

An existing group of 20 firms, this network is trying to expand its efforts into group benefits and cost reduction activities. Received \$2,100.

Mehlretter Associates  
Glen Mehlretter  
6808 Garrison Court  
Raleigh, NC 27612  
P: (919) 848-0527

Attempting to create a network in order to jointly implement quality principles. Received \$10,000.

Kenny Associates  
Neal Kenny  
1600 Pony Run  
Raleigh, NC 27615  
P: (919) 872-2560

Attempting to create a network of firms to collaboratively address common R&D and product development problems. Received \$10,000.

## OHIO

### Thomas Edison Program

Dr. Norm Chagnon, Center Liaison  
Ohio Department of Development  
77 South High Street, 26th Floor  
Columbus, OH 43266  
P: (614) 466-5867

Manages the grants to five network projects in the State. See catalogue for four descriptions.

### Southern Ohio Wood Industry Consortium

Ivy Steel, Coordinator  
Jeffrey A. Spencer, Program Director  
Ohio Valley Regional Development Commission  
740 Second Street, Room 102 Griffin Hall  
Portsmouth, OH 45662-4088  
P: (614) 354-7795; F: (614) 353-6353

A network of 22 wood manufacturers, mostly saw mills, in rural Ohio, which has been meeting once a month since February 1991. It is focusing its efforts in four areas: training (i.e., technical, supervisory and management development), obtaining financial assistance and educating bankers about the industry, research and development on wood residue and waste wood, and disseminating new product ideas. Membership fees depend on firm size and ranges from a minimum to \$100 to a maximum of \$250. The network has received funds from Ohio's Department of Development.

## OREGON

### Joint Legislative Committee on Trade and Economic Development

Joseph Cortright, Executive Officer  
State Capitol, Room 132  
Salem, OR 97310  
P: (503) 378-8811; F: (503) 373-7196

The State has allocated \$2.25 million over 2 years to promote value-added wood products manufacturing. A Wood Products Competitiveness Corporation was established to establish manufacturing networks through grants, technical assistance and broker training.

Oregon Economic Development Department

Mary Russell, Research Analyst

Policy and Research Section

775 Summer St. N.E.

Salem, OR 97310

P: (503) 373-1200

or

Janet Jones

P: (503) 378-2286

Oregon has funded a \$1.5-million networking initiative in 13 industries. One-third of the money has been allocated to begin industry associations, network broker training programs and several pilot projects.

**PENNSYLVANIA**

Office of Technology Development

Robert W. Coy, Director

Department of Commerce

Commonwealth of Pennsylvania

352 Forum Building

Harrisburg, PA 17120

P: (717) 787-4147; F: (717) 234-4560

Pennsylvania has funded a number of networking projects through its Manufacturing Innovation Network programs and the State's Industrial Resource Centers (see catalogue listing).

**SOUTH CAROLINA**

Venture Development and Finance

Merriweather Jones

Enterprise Development, Inc., of South Carolina

P.O. Box 1149

Columbia, SC 29202

P: (803) 737-0888

The organization has received \$100,000 from the Appalachian Regional Commission as a part of a larger grant to establish a Quality Management Center. It will be used to publicize the network concept among State manufacturing firms and promote networking through a challenge grant program.



## **VIRGINIA**

### Virginia Center for Public/Private Initiatives

Dana Hamel, Executive Director

P.O. Box 549, MCU Station

1010 East Marshall Street

Richmond, VA 23298

P: (804) 786-6582; F: (804) 786-5155

Contact for networking activities being initiated in the State of Virginia.

## **WEST VIRGINIA**

### West Virginia University Industrial Extension Service

Bob Lehman, Director

549 Engineering Science Building

Morgantown, WV 26506-601

P: (304) 293-3800; F: (304) 293-7163

Contact for networking activities being initiated in the State of West Virginia.

## **WASHINGTON**

### Northwest Policy Center

Paul Sommers, Research Director

University of Washington

327 Parrington Street DC-14

Seattle, WA 98195

P: (206) 543-7900; F: (206) 453-1096

Provides technical assistance to five networking projects that have been funded by the Northwest Area Foundation in several States.

## WISCONSIN

### Training Consortium, Center on Wisconsin Strategy

Joel Rodgers and Wolfgang Streeck, Co-Directors

8116 Social Science

University of Wisconsin, Madison

Madison, WI 53706

P: (608) 263-3889; F: (608) 262-9046

The Center on Wisconsin Strategy is attempting to establish a comprehensive training infrastructure among a consortium of eight to 12 large international metalworking firms and unions. The planning phase is being funded by the Joyce Foundation. The program, which would cover close to 15,000 employees, has four elements: (1. industry-wide benchmarking of skill competencies and training efforts; (2. a large-scale technical preparation demonstration project, with a youth apprenticeship program; (3. governance of training enterprises by joint labor/management committees in both union and nonunion shops; (4. improvements in the quality of public and private training through using in-house trainers who are workers, credentialing and allocation of 3 percent of payroll costs to training of on-line production workers. The firms have agreed to these design principles. Committees have been formed to work out details and begin implementation. This work was in spring 1992.

## APPENDIX B:

### RECOMMENDED CASE STUDIES ON NETWORKS

The following case studies of the activities of manufacturing networks have been recently published:

1. Manufacturing Networks and State Policy in North Carolina: Introducing Change. April 1, 1992.

Case studies of five network demonstration projects.

Contact:

Southern Technology Council

Leai Smith

Administrative Assistant

P.O. Box 12293

Research Triangle Park, NC 27709

P: (919) 941-5145; F: (919) 941-5594

2. "Fostering Cooperation in Michigan's Industrial Base: A Final Report on the Group Service Grant Program." Linda Ewing.

A description of Michigan's experience with group service grants.

Contact:

Industrial Technology Institute

Martin Grueber

P.O. Box 1485

Ann Arbor, MI 48106

P: (313) 769-4423

3. "The Philadelphia Woodworking Initiative: Manufacturing Networks as a Model for Improving Industry Performance." Gregg A. Lichtenstein and Anthony J. Girifalco. Delaware Valley Industrial Resource Center: Philadelphia, PA. January 1992.

Chronicles of the development of two woodworking networks.

Contact:

Delaware Valley Industrial Resource Center

Anthony J. Girifalco

12265 Townsend Road, Suite 500

Philadelphia, PA 19143

P: (215) 464-8550; F: (215) 464-8570



## APPENDIX C:

### AUTHOR

Gregg A. Lichtenstein has been working as a broker for manufacturing networks in the metalworking and woodworking industries over the last 4 years. He also works with small business incubators in order to promote networking among start-up firms. Mr. Lichtenstein consults and conducts research in the area of entrepreneurship, manufacturing networks and new product development in small and medium size firms. He has a Ph.D in management from the Wharton School of the University of Pennsylvania and serves as the Research Director of the National Business Incubation Association. 7348 Malvern Ave. Philadelphia, PA 19151. (215) 473-5393.



**U.S. Department of Commerce**  
National Institute of Standards and Technology  
Gaithersburg, MD 20899

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